

# DRY FARMING NUMBER THE NORTH DAKOTA FARMER



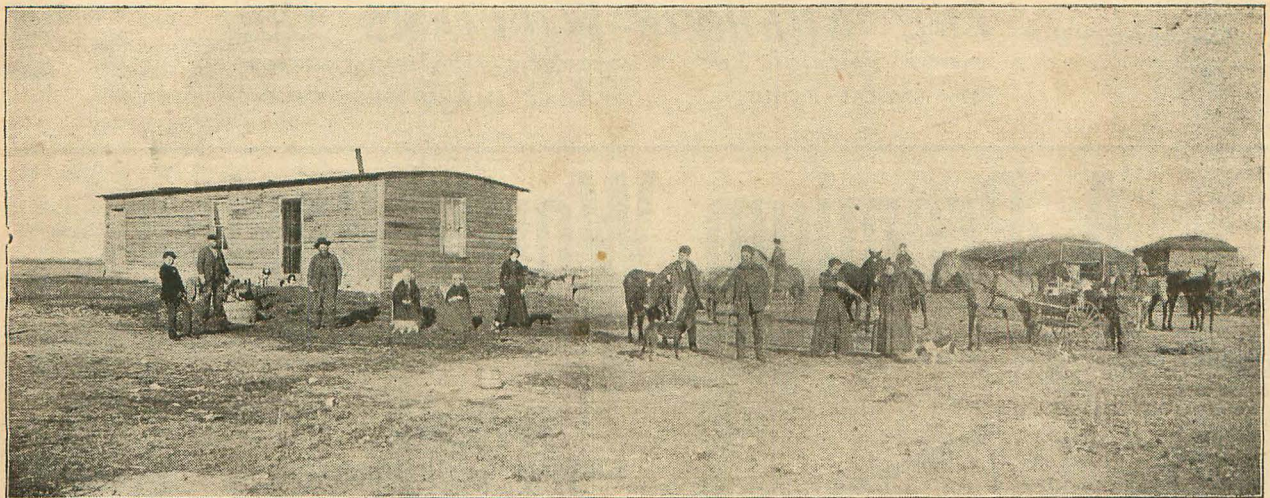
"THE NORTH DAKOTA FARMER FOR NORTH DAKOTA FARMERS"

Alex. Alin

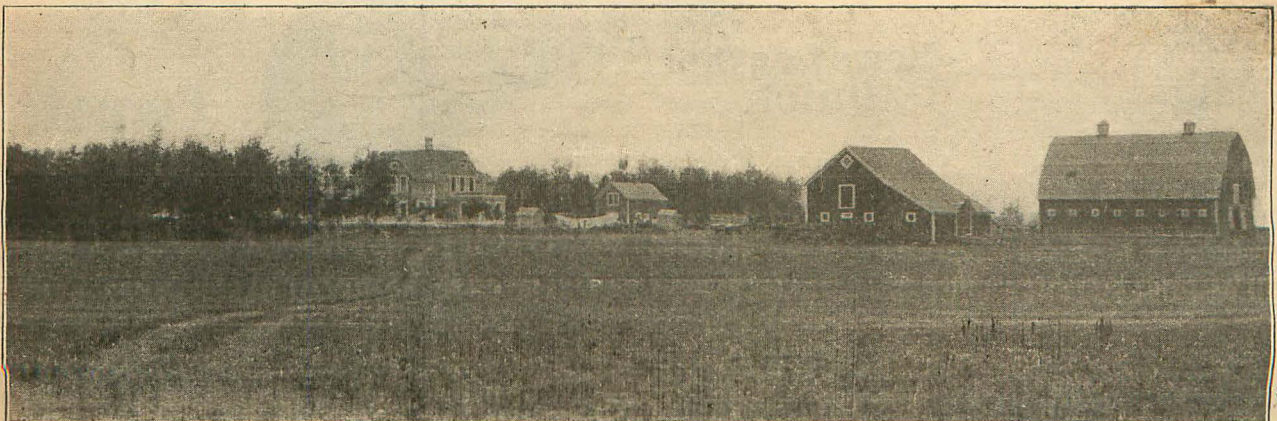
Vol. 12, No. 1  
LISBON, N. D.

JULY 15, 1910

50 Cents a Year  
FARGO, N. D.



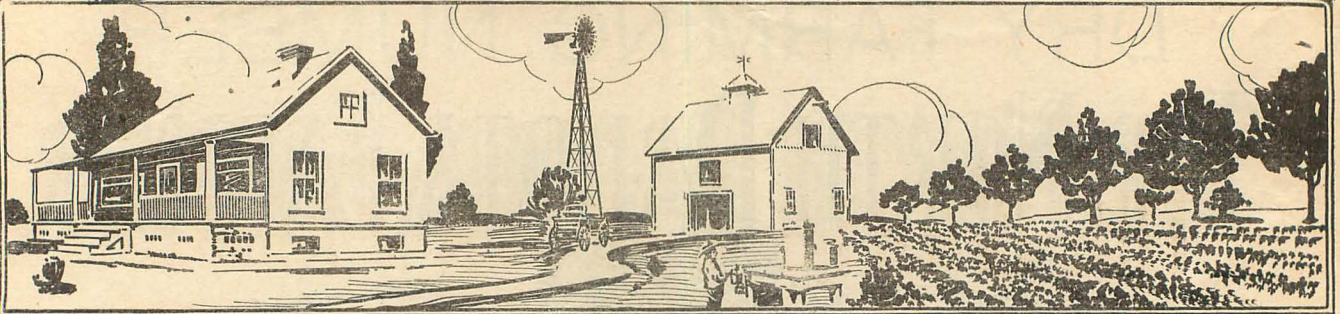
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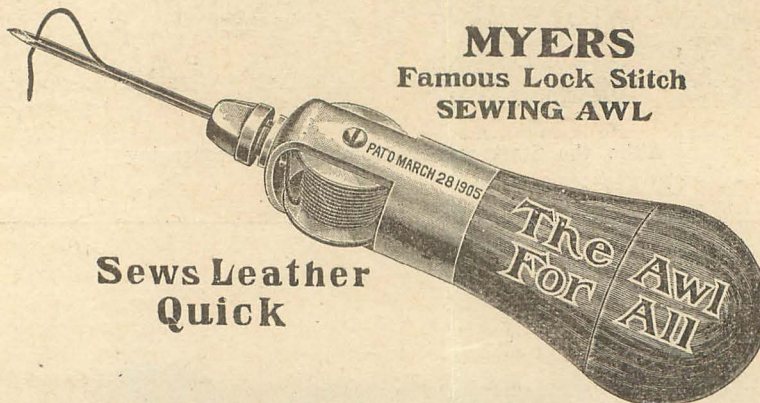


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# THE NORTH DAKOTA FARMER

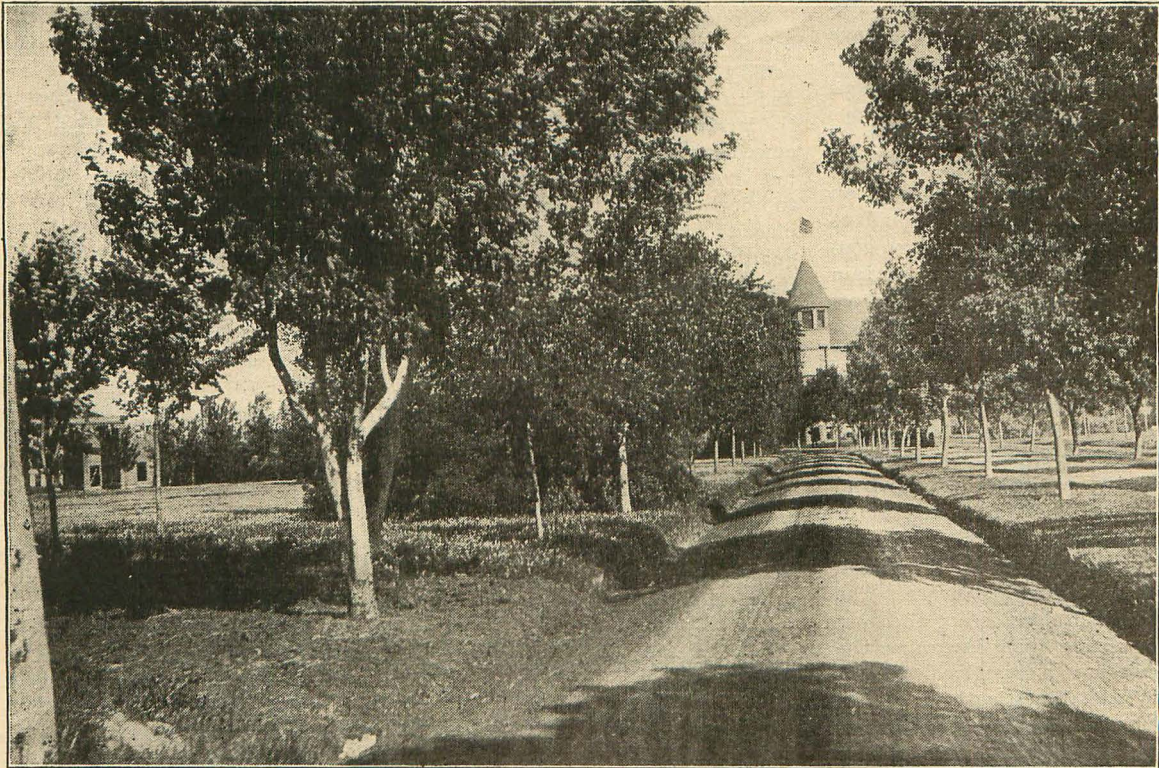
Vol. 12, No. 1

LISBON and FARGO, N. D., JULY 15, 1910

50 Cents a Year

## The Drouth of 1910

By J. H. Worst, President Agricultural College



View of the Administration Building North Dakota Agricultural College

**D**OUBTLESS for years to come we will refer to the drouth of 1910 as we have heretofore referred to the drouth of 1901.

Without question the meager harvest of the present year will cause farmers to economize wherever possible in order to tide over. The prosperous years that preceded the present one had a tendency to promote extravagance along many lines. It seldom occurs in the history of agriculture that farmers can afford to be extravagant. Great fortunes are not built up in the business of farming. Men become well-to-do—are able to provide their families with all the comforts and some of the luxuries, and be-

come able, occasionally, to enjoy travel, but rarely amass great fortunes as in some other industries. By strict economy, however, but few who engage in the business of farming need make a failure of it. Where great fortunes are possible for the few in manufacture, speculation or mining, the probabilities of financial failure are equally present, for the many.

Among the economies that will be practiced, doubtless, will be that of keeping the young people out of College the coming school year. This will prove a serious mistake. There are many ways that suggest themselves for the practice of economy, but when it is applied to

the intellectual and moral improvement of children it is a fatal mistake. The present failure of crops more than ever demonstrates the necessity of an education and training that will enable the coming farmer to very largely eliminate the element of chance in his farming operations. A thoro knowledge of practical agriculture will very largely ward off the evil effects of drouth, provided that that knowledge is put into actual practice.

It is easy to determine, when riding thru the country, the fields that received proper cultivation and those that were seeded in the ordinary hasty, care-

(Continued on Page 6.)



# Principles of Dry Farming

Compiled from Bulletins of Experiment Stations  
in Semi-arid West

**T**HE importance of extending the productive area of farm lands in the United States has been especially emphasized in recent years, with the result that much land hitherto considered unsuited to farming has been brought under cultivation. In this class are the large areas in the western half of the United States, where the rainfall is deficient. It was evident that if these lands were to be profitably utilized for agricultural purposes other than grazing, new methods of farming must be adopted. With this object in view, this Department and several of the experiment stations situated in arid or semiarid regions have carefully studied the agricultural conditions and possibilities of these regions and made extensive tests of the crops and methods of culture adapted to them. These investigations, as well as the practical experience of settlers on dry lands, have now gone far enough to make it possible to lay down some general principles and to indicate certain methods which must be observed in order to guard against failure in dry farming. The following is a summary of some of the more important facts bearing upon this subject as brought out by recent reports of this work by the Department and the experiment stations:

Dry farming is also called dry-land farming or arid-land farming. It is generally defined as farming without irrigation in regions where the annual rainfall is between 8 and 20 inches. The fact that rainfall alone is not the only moisture condition which determines the crop production of a given locality is indicated by the investigations of the Office of Forage Crop Investigations of the Bureau of Plant Industry of this Department, which states that for the production of such drought-resistant crops as alfalfa, slender-wheat grass, tall-oat grass, and brome grass the "investigations indicate that the minimum rainfall is approximately 16 inches in the Dakotas, 18 inches in Nebraska, 20 inches in Kansas \* \* \* and up to 30 inches farther south." In other words, to produce a given crop the amount of rainfall necessary is much greater in the warmer regions, where evaporation removes so much moisture.

Dry farming is made possible in two ways: (1) By careful tillage, and (2) by the introduction of drought-resistant crops or drought-resistant varieties. Even where dry farming is followed irrigation is usually recommended for the small areas to be devoted to garden

crops to carry the household thru years of crop failure, which are more frequent in these semiarid regions than in regions where the rainfall is greater.

The principles of tillage are almost exactly the same as for other regions, or even for the semiarid regions where irrigation is practiced, with emphasis laid upon the conservation of moisture: (1) Because the supply is low, and (2) because one and one-half times as much water is required to produce a pound of dry matter in the plant in these drier regions as is required in more humid climates.

Surface cultivation is constantly resorted to in order to maintain a mulch or lid to prevent the escape of moisture and to keep down weeds, which drain the land of its water. This mulch is renewed as soon as possible after each rain, but should not be made sufficiently fine to allow the wind to blow the soil from place to place. This is especially to be guarded against on sandy soil, which should be worked sooner after rain has destroyed the mulch than the clay soil, which is more inclined to puddle, bake, or otherwise get out of good physical condition. The third advantage arising from frequent surface cultivation is the admission of air to the roots of the crops supplying them with oxygen. This air also encourages the growth of the friendly bacteria which prepare plant food by breaking down humus and forming the nitrates which can be readily taken up by the roots of the plants.

Small shovels are usually preferred to larger shovels: (1) Because they do not ridge the soil and so leave a smaller surface to give up moisture to the sun and winds; (2) the greater number of shovels stirs the soil more uniformly in the shallower zone reached; and (3) because of their failure to go as deeply as the larger shovels there is less danger of root pruning. The disadvantage of the small shovel arises from its lack of efficiency in killing larger weeds.

In extreme cases it is necessary to store up two seasons' rainfall to be used for a single crop. This is usually done by summer tillage or clean summer-fallow, which differs from the old system of summer-fallowing in allowing the land to lie for a longer period unused, and in the more perfect maintenance of the surface mulch and exclusion of weeds. Summer tillage not only stores the water or future use, but also brings the soil into the best physical condition for the reception of the fall-sown crop, which is

most frequently recommended for the semiarid regions.

The North Platte Station in Nebraska finds that summer tillage will store water weighing 15 per cent or more than one-seventh as much as the upper 6 feet of the soil. This is equivalent to about 14 inches of rainfall, and will give a fair crop of wheat even with a very low rainfall the following season. During the season of 1908 this station was able to hold only 50 per cent of the rainfall.

The Washington Station has found that 40 bushels of wheat per acre can be produced with 12 inches of water, and that if 50 per cent of the precipitation for two years can be saved a yield of 30 bushels per acre can be obtained with an annual rainfall of 10 inches upon the same land which produced 40 bushels with 12 inches of water and under equally favorable conditions. Fifty bushels of wheat were similarly produced by saving the same percentage of a 15-inch annual rainfall.

The percentage of rainfall retained will vary from season to season, and depends: (1) On the rate of rainfall during a given storm, (2) on the condition of the soil, (3) on the treatment of the soil following the rain, and (4) on the amount of humus or decayed organic matter in the soil. In a heavy storm the percentage of water escaping as "run-off" is very high, while the same is true on a hard uncultivated surface or one on which the surface mulch has not been restored since the last rain. Showers that do not penetrate beneath the surface mulch are soon taken up again by the sun and winds, but serve to re-establish the hard surface which draws moisture from beneath. So these light showers are a damage except in case of crops nearly ripe or undergoing a period of drought. In case of drought their chief advantage is to check the evaporation from the leaves of the plants rather than to feed the thirsting plant thru its leaves, as it sometimes believed. To increase the ability of the soil to hold moisture, thin top-dressing of strong manure chopped or cut into the soil by means of a disk is recommended.

Summer tillage is especially recommended for fall-sown crops rather than those which would require the land to lie bare to the winds thru the winter. It has yielded a profit in the case of oats, spring wheat, and barley. A short period of summer tillage is recommended for alfalfa to be sown in July or August as better than planting earlier on a land foul with weeds or drained of



moisture by a previous crop. The most pronounced advantage of summer tillage has been realized with fall-sown wheat. In 1907 the North Plate Station in Nebraska obtained an average yield of 59 bushels per acre on  $4\frac{1}{2}$  acres of summer-tilled land, while an adjacent plot not summer tilled produced only 24.4 bushels per acre. Other land not under the control of the station averaged from 15 to 20 bushels per acre.

For summer tillage in western Nebraska, stubble land should be double-disked immediately after the removal of the grain crop to prevent the escape of moisture and growth of weeds. As soon as the frost is out of the ground the following spring it is again double-disked and the surface kept loose and free of weeds by the alternate use of the disk and tooth harrow until June, when the land is plowed 8 inches deep. This

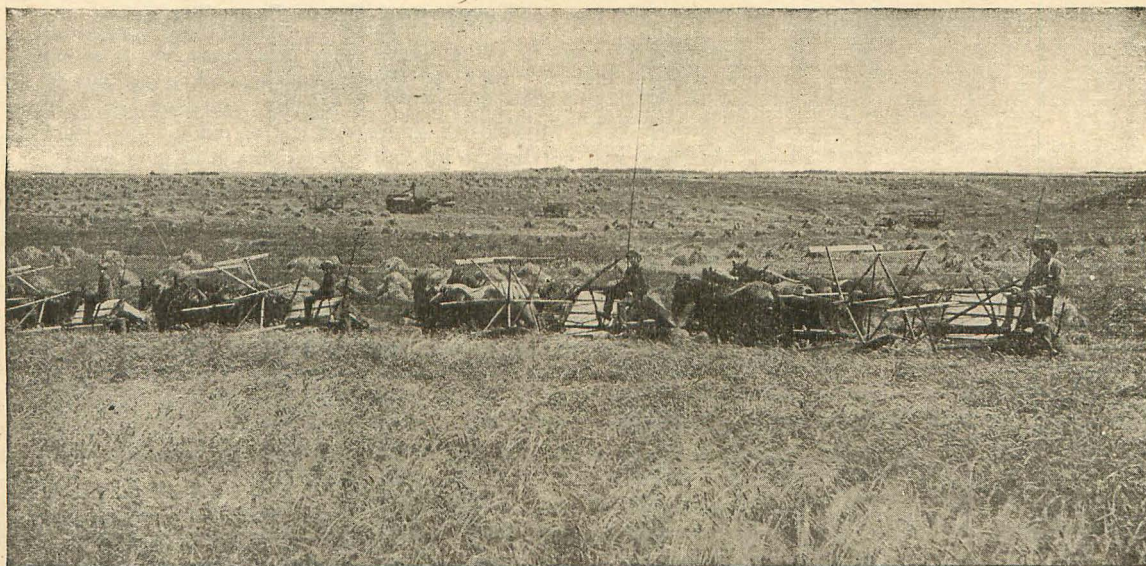
neath sufficiently firm to draw water from the soil still lower, in order that it may be held at this point available for the roots of the plant without being allowed to escape to the air above. Subsurface packing also causes stubble straw or coarse manure to decay more rapidly by bringing them a greater amount of moisture. This subsurface packing is accomplished either by a special tool, known as a subsurface packer, or by a disk well weighted and run straighter than where the purpose is to stir the soil, thus enabling it to penetrate more deeply and pack the soil immediately below the surface. An extra horse may be hitched on the plowed side, thus rendering more firm the soil over which it walks, or reestablishing the surface mulch by dragging a section of harrow after it.

Since summer tillage has a tendency

to rot the large amount of vegetable matter turned under.

The principles governing drought resistance in the crops or varieties best suited to dry-land agriculture are less perfectly understood than are those of the tillage problems involved. The drought-resistant plants generally have one or more of these properties: (1) The ability to root deeply and obtain water from the lower strata of the soil, (2) the ability to grow rapidly and mature during the season of greatest rainfall, (3) the ability to resume growth after withstanding a period of drought, or (4) in a more limited number of cases to prevent excessive evaporation by a small leaf surface or a glazed surface, as in the case of the cacti.

The crops that have given the best results in Montana are flax, brome grass, barley, wheat, potatoes, corn, and alfalfa.



Possibilities of Durum Wheat Culture in the Semi-arid Sections.

gives a deep mulch capable of receiving and retaining a large amount of rainfall. The surface mulch is then maintained without pulverizing the soil sufficiently to allow it to drift with the wind until the desired crop is to be sown.

A deeper mulch is required by "a fine, heavy soil," because it is more difficult to keep open than the sandy soil. The deep mulch is not so readily destroyed by light showers and therefore requires less frequent renewal. It is more efficient than the shallow mulch in keeping down weeds. A mulch 3 to 4 inches in depth can usually be maintained by the use of the spike-tooth harrow and the disk. It is usually sufficient to renew this mulch within a reasonable period after each rain, but during a prolonged drought it should be renewed more frequently.

Altho the surface mulch is maintained it is of advantage to have the soil be-

neath sufficiently firm to draw water from the soil still lower, in order that it may be held at this point available for the roots of the plant without being allowed to escape to the air above. Subsurface packing also causes stubble straw or coarse manure to decay more rapidly by bringing them a greater amount of moisture. This subsurface packing is accomplished either by a special tool, known as a subsurface packer, or by a disk well weighted and run straighter than where the purpose is to stir the soil, thus enabling it to penetrate more deeply and pack the soil immediately below the surface. An extra horse may be hitched on the plowed side, thus rendering more firm the soil over which it walks, or reestablishing the surface mulch by dragging a section of harrow after it.

Since summer tillage has a tendency

to exhaust the humus of the soil and so reduce its plant food and water-holding capacity, it should be resorted to only in connection with a rotation that will overcome these tendencies. A rotation recommended for localities where the crops thrive well is "summer till and sow winter wheat; disk and fall plow the wheat stubble for corn the next year; disk the corn stubble for a spring grain—oats, wheat, or barley; apply manure during the winter; disk in spring and plow for (sorghum) cane, which crop completes the rotation." Another means of restoring the humus content of the soil is by turning under green crops of rye and cowpeas or other green-manuring crops. This method has given almost the same advantages as summer tillage, at the same time enriching the soil by the addition of humus, but in very dry years trouble may be encountered thru lack of sufficient water

Thin seeding is quite generally recommended. Flax is best adapted for use as a first crop on spring-broken dry-land sod. It has shown an average yield of over 12 bushels per acre in all tests. Brome grass gives a higher yield than any other forage crop reported, giving a hardy growth and an abundance of good hay. Tall-oat grass is slightly below brome grass in yield. Alfalfa has as yet given very low results at these stations, but only one year's work has been reported. Kubanka, Ghirka, and Glyn-don wheats seem well adapted to dry-farm conditions in this state and are freely used for bread-making purposes. Turkey Red fall wheat has given a higher yield than any other sort grown. A higher average yield has been obtained from fall-sown crops than from spring-grown crops. White hull-less barley has been the earliest variety to reach maturity. Corn has yielded 4.44 tons



per acre on one of the experimental farms of Montana, indicating its ability to yield forage under dry-farm conditions. An average yield of 124 bushels of potatoes per acre proved this crop a success on the farms of this state, but sugar beets failed to grow readily enough to make them a commercial success, altho profitable to add succulence to the rations of the farm animals. Intertillage of crops has shown an absolute decrease on these farms of about 7 bushels per acre in the case of wheat.

The Wyoming Station has obtained good results with the same crops under its conditions and adds to these winter rye, spring rye, oats, spelt, sugar beets, and in the lower altitudes milo maize.

In western Nebraska good results have been obtained with winter wheat, spring wheat, oats, barley, emmer or spelt, corn, sorghum, Kafir, milo, brome grass, and in the valleys alfalfa has proved a most valuable forage crop, but its success on the table-land is more doubtful. Thruout these semiarid regions 3 to 5 pecks per acre have given better results in the case of small grains than seeding at higher rates. The work of the Office of Forage Crop Investigations has shown good results from the use of Siberian millet sown in the fall on summer-fallowed land, of barley used in the spring as a catch crop, and of the various sorghums experimented with. The Sumac sorghum has proved the sweetest and heaviest yielding variety as far north as the Kansas-Nebraska line. North of this point Red Amber sorghum matures earlier and produces a heavier tonnage of better feed than is secured by the growth of millet. The Kaffirs produce more seed and less sugar than the Sumac sorghum and are adapted to the same region. They have the ability of suspending growth when the moisture supply is shut off and resuming it when the drought is over.

Cowpeas have succeeded well in the eastern portion of the dry-farming region when cultivated in rows 3 feet apart. They are less drought resistant but also less subject to the attacks of rabbits as are soy beans. The Bonavist (*Dolichos lablab*) is still more drought resistant, as is also the Kulthi (*D. biflorus*). The latter is the best legume for hay production experimented with at Chillicothe, Tex. The moth bean (*Phaseolus acutifolius*) is successful but less valuable than Kulthi. Alfalfa requires at least 15 inches of rain in the Dakotas or 24 inches in Texas for successful growth when broadcasted. If cultivated in rows it may be made to produce profitable crops of seed with still less rainfall. Millet or sweet clover is a good soil prover and of value for forage on sandy or moderately alkaline soils.

As pointed out in previous articles on this subject, too much emphasis can not

be laid on the importance of supplementing dry farming with at least enough irrigated farming to insure garden products and forage for stock as a protection against possible failure on the dry land, because whatever the methods adopted, there are likely to be seasons when total or partial failure will be inevitable. The meteorological records of the dry regions as a rule show that wet and dry years occur in cycles and that seasons of excessive drought occur when, except by means of irrigation, little or nothing in the way of cultivated crops can be grown.

The Office of Experiment Stations of this Department has been investigating for several years the possibility and best methods of irrigating small areas in dry regions in connection with the farming of larger areas without irrigation. It

## Principles of Dry Farming

(Continued From Page Three)

less and slipshod manner. Where agriculture was intelligently practiced the crops were the last to suffer and will be last to utterly fail. All fields of grain that will be worth cutting at all will prove profitable only from the fact of having been properly cultivated.

North Dakota is a purely agricultural state. The prosperity of all classes must depend upon the prosperity of the farmer. The farmer alone produces wealth and distributes it among the people. Education has a mighty bearing upon the activities as well as upon the sentiments of a people. If we would prosper in this state of ours; if we would build up flourishing schools, lucrative business enterprises, and make the professions prosperous as well; if we would increase the wealth and business of our cities and villages, if we would encourage railroad construction, etc., we must look to the farmers of the state to accomplish all this. The glory of North Dakota will for many years to come undoubtedly consist in its many moderate-sized farms highly cultivated, and its country homes beautified and made sanitary and delightful. This requires education that has a direct bearing upon the natural forces the farmer has to deal with. The pursuit of subjects thus related to rural activities are no less cultural and are no less elevating in their tendencies than those bearing the stamp of tradition. For the masses, utility in education cannot be ignored. I have never pleaded the cause of the well-to-do, the ambitious and those desiring the liberal education as defined by the average educator. They are able to care for themselves. At best less than one per cent of the children can enjoy the recognized liberal education, and doubtless that number will fill the social, business and political needs of the country. The 99

per cent, however, those who must perform the world's work are worthy of the highest consideration. While their education cannot be of the liberal type, yet it should be more than a partial preparation to enter a higher institution of learning. Their education should be concrete and as far as possible directly related to their life work. The fundamentals of education vary but little, it is true, but beyond this our educational system should take due cognizance of the needs of the future citizen. The demands of the children and their parents should be taken into consideration. To leave the arrangement of courses of study and the subjects that compose them entirely to educators who are not in experimental sympathy with the toiling masses, and who for want of experience are wholly unacquainted with their need, is to ignore the best interests of the great body of American children. In other words, whatever may be thought necessary in the way of education for those who will have charge of our affairs in the higher walks of life, still those who by nature and environment must be responsible for the prosperity of the state should have paramount consideration. The education in an agricultural state should be very largely agricultural. Agriculture, nature study and domestic science should be as common in the classroom as oxygen is in the air.

I am confident that had agricultural education been given the prominence it merits during the past twenty years that crop failures on account of drought would become exceedingly rare; that the prosperity of the state could be easily doubled and that advertising of this character would go further toward encouraging immigration than could possibly be promoted by any other means.



# With the Better Farming Special

## CORN AND CLOVER

By Prof. Shepperd with the "Better Farming" Special

Corn and clover are two important crops to the North Dakota farmer in that they both leave the land in a better condition for producing a crop of grain. They are both weed killers and also furnish valuable crops and particularly so for live stock, which must form a part of our farming if it is to be the most successful.

In speaking of corn he referred to the fact that a certain state resident has lately stated that a tribe of indians inhabited the country between the Mississippi and Missouri rivers which were altogether different from the Sioux and that they raised corn. He also referred to the fact that Lewis and Clark in their expedition wintered in Mercer County, and that they stated that if it had not been for the corn they got from the indians they would have been obliged to return to St. Louis for supplies, showing that corn has been raised in this section before white men came here. Corn has been grown enough in this state to settle that it is one of the coming crops. He warned against trying to get too large varieties and advised farmers to stick to the early maturing kinds as they will prove more satisfactory. He referred to the fact that if the food value of the corn crop is taken as one when the corn is in tassel; it will double by the time the silks appear, treble when in milk, quadruple when in the dough stage and when ripe the food value will be five times what it was when tasseling out, which makes it quite clear that it pays to grow a variety that will be sure of maturing. He emphasized the need of selecting the seed early, preferably in the field, to dry it thoroly, which seems to increase its germinating power, nor will it kill the seed if it should freeze as it will do when the seed is not dry. He also stated that corn should be planted early on well prepared land. He advised cultivating it shallow, but to cultivate thoroly. He stated that the corn seemed to make fully as much growth in the twenty-four hours here as in the so-called corn belt, undoubtedly due to the longer days and the rich soil. The value of a corn crop as a feed is known to all. This, however, is not the only good from corn, as it leaves the land in an ideal condition for the succeeding crop of grain. The cultivation which is given it prevents evaporation and so stores up moisture so that a crop of corn is as good a preparation for grain as is the

bare fallow. In fact it is often thought to be better.

Clover is another crop that is proving itself to be well adapted to this section and it is also a very important crop to grow from the standpoint of what it will do for the soil, as it actually leaves it richer than before it was grown. He stated that if clover should fail that was no sign it would not grow, as it might mean that the right conditions were not present, and also that where clover has been sown once it will be easier to get a good stand the second time. The clover plant must have some germs living on its roots, the presence of which is indicated by the presence of nodules. It happens in some places that these nodules are not present and they have to be introduced, which can be done by sowing clover for a few years which will introduce them gradually. They may also be added by taking soil from a field that has been growing clover successfully and sowing it at the rate of 10 pounds per acre and harrowing it in thoroly. One good way is to sow a couple of pounds of clover seed with the grain crop each year. This will in a few years introduce enough germs to get a successful stand. Clover should be sown on well prepared land, disced corn stubble does very well. When sowing for the first time, use 12 to 15 pounds of seed per acre and a light coating of stable manure should be applied. A nurse crop can be sown with it, and barley has proved to be the best, altho it will make surer growth the first season if sown alone. The value of clover for hay is apparent to all. It produces an unusual crop of seed in this section; yields of 3 to 4 bushels of seed per acre being common. When grown for hay it should be cut back sometime the latter part of June, as the first crop does not produce much seed.

With corn and clover in the rotation, agriculture becomes a permanent thing.

## THE DISTINCTION BETWEEN THE BEEF AND DAIRY TYPES OF CATTLE

By Prof. W. B. Richards, "Better Farming" Special Train

Many farmers continue to raise cattle for market for beef purposes from stock that do not possess any blood of the beef breed, and consequently they lack what is known as the beef type. It is impossible to produce beef economically from cattle of the dairy type, or even from cattle that possess any considerable amount of this blood.

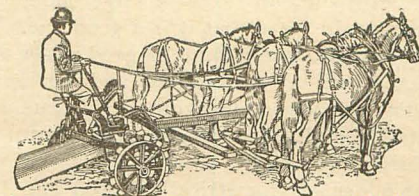
To produce an animal of the beef type it is necessary to use the beef breeds of cattle, such as the Shorthorns, Here-

fords, Aberdeen Angus, and Galloway. Cattle of this breeding put on flesh very much more rapidly and of a better quality.

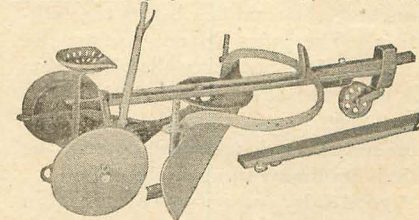
A beef animal could be described in a general way as a low down compact blocky animal. He must have a short blocky head, a wide breast, a deep wide chest, a broad back, a good spring of rib, heavy full thighs. He must have a pliable mellow skin, for this quality indicates a good fleshing tendency.

## The Dairy Type

The points that a cow should possess if adapted to economical milk production are quite the opposite from what is seen in the beef animal. In comparing the steer, Dick, on the "Good Farming"



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**GRAND 5-YEAR OFFER, PAGE 20**



special with the Jersey cow, it will clearly indicate this is the case, for the type of the two animals is quite a contrast.

The dairy cow possesses a long face, thin slender neck, a sharp projecting shoulder. She is not very wide in the chest, but her capacity of chest is due to her depth which is greater in proportion to her size than you will find in the beef animal. She possesses large barrel which indicates a good capacity for digesting her food. Her depth here should exceed her depth in any other portion of the body. A dairy cow should have a good width at the hips. Her thighs should be lean and free from muscling. She should be open between her thighs.

Much attention should be given the udder of the dairy cow—a large udder does not indicate that it is a good one. They are often very fleshy; a good udder should be elastic and pliable, and shows many folds when milked out. The teats should be placed equal distances apart, which is generally always the case if the udder is symmetrical and well proportioned. Large milk veins are good indications, the more winding and branching they are the better the indication. The veins do not carry milk, as many think, but carry the blood from the udder to the body and the more blood that passes thru the udder the more milk there is produced because the milk is produced from the blood.

A good dairy cow possesses rather thin pliable elastic skin. A course harsh handling skin is a poor indication. When cows possess these qualities of skin they are rarely good producers.

#### NORTHERN PACIFIC CHANGES ENGINES TO OIL BURNERS

##### Motive Power on the Coast Altered to Prevent Forest Fires

The Northern Pacific Shops at South Tacoma have turned out a score of engines which have been converted from coal to oil burners. All of the locomotives operated by the Northern Pacific between Puget Sound and Portland will burn oil to obviate the possibility of forest fires. In that territory Northern Pacific tracks extend thru heavily wooded sections, and the elimination of the danger of starting forest fires therefore is a matter of great importance to the railroad company, the property owner and to the state.

The oil used is received by steamer from the California oil fields and storage tanks have been built between the docks and the tracks at Tacoma. The tenders of passenger engines are built to carry 3,000 gallons of oil, sufficient for a round trip between Tacoma and Portland.

## AT THE AGRICULTURAL COLLEGE

By W. C. Palmer, Agr. Editor

Food bulletin No. 24 takes up the subject of milling Durum wheat. The results show that it costs  $3\frac{1}{2}$  cents more for power to grind a bushel of Durum wheat than Fife or Blue Stem, while at the present time there is a difference in price of 26 cents per bushel. It also shows that the mixing of 15% of Durum flour with the hard wheat flours improves the bread. At the present prices it costs \$4.28 to produce a barrel of Durum wheat flour and \$5.36 to produce a barrel of Fife or Blue Stem wheat flour, showing that quite a saving can be made by combining the two kinds of wheats and at the same time improve the quality of the product. The cost for grinding 100 barrels of Durum wheat was \$7.43; for grinding 100 barrels of Fife or Blue Stem wheat, \$7.00. The bulletin also contains an analysis of whiskies and many articles of general interest. It can be had by writing to the Agricultural College at Fargo.

Mr. G. L. Tibert went to Dickinson to see about the erection of a seed house at the sub-station there; \$4500 having been set aside for this. From there he goes to Hettinger to see about the erection of a house on that substation.

Two hundred are taking the course in Gasoline and Steam Engineering.

The Good Roads Convention, scheduled for June 22nd and 23rd, was not largely attended but the interest was very good.

Mr. S. R. Cox of Arcola, Ill. delivered an able address on "Method of Making Good Roads." Mr. Cox is a "good road" enthusiast and the town in Illinois over which he has superintendence enjoys the reputation of having the best dirt roads in the state. As the soil conditions are practically the same in the Red River Valley of North Dakota and Minnesota as those of Illinois, the principles applied there would serve the purpose in the Red River Valley. No foreign material is used; only prairie dirt.

Mr. H. H. Gross, the Road Expert of Chicago, Ill., addressed the convention Thursday on the subjects, "Social and Educational Advantages of Good Roads" and also "What Legislation is Necessary to Make Good Road Building upon a Large Scale Practical?" In both addresses Mr. Gross condemned the present system in vogue and urged the payment of road taxes in cash to be expended upon the roads by some one who understands road making, as a blacksmith understands horse-shoeing, or as a tailor understands making a suit of clothes.

The convention was also addressed by

Mr. S. Johnson, Director of Library Commission, Bismarck, N. D. on the subject "Good Roads Legislation: Some Hints from—the Experience of Other States."

Mr. Geo. W. Cooley, State Engineer, St. Paul, Minn. delivered an address on "The Construction and Maintenance of a Primary System of Highways." He agreed fully with Messrs. Cox and Gross of Illinois and urged a change of law which would enable the road tax money to be expended under the direction of a competent road maker.

Excellent addresses were also delivered by Prof. Dolve of the Agricultural College on "Good Roads from North Dakota Soil"; Mr. J. T. Voschell, Highway Engineer, Good Roads Department, Washington, D. C. on "Advantages of Improved Earth Roads"; T. R. Atkinson, State Engineer, Bismarck, N. D. on "Road Making as an Engineering Proposition," and a most practical paper on "Road Materials and Methods in North Dakota" by Prof. E. J. Babcock, University of North Dakota. Governor Burke also addressed the convention.

The convention decided to effect a permanent organization with a fee of 50 cents per annum as a condition of membership. It was decided to hold the next convention at Bismarck some time next winter.

For the ensuing year Dean J. H. Shepperd of the Agricultural College was elected President, Hon. Geo. Welsh, Bismarck, Vice-President, Edward Litton of Larimore, Secretary-Treasurer.

On June 24th the Good Roads Convention was continued by the Grain Growers Department of the Society of Equity of North Dakota, South Dakota and Minnesota. Matters pertaining to the Terminal Elevator, better prices for Durum wheat, and the handling of the 1910 crops were discussed by able speakers.

The first annual meeting of the Secretaries and Registrars of the landgrant Colleges will be held at Detroit, Mich. Aug. 16th and 17th. W. A. Yoder, Secretary of the North Dakota Agricultural College, has felt the need of more uniform systems of accounting and granting credits, so with A. H. Parrott, Registrar of the N. D. A. C., has begun this organization which will be completed at Detroit on the 16th and 17th of August. Most of the Secretaries and Registrars will be present as they have expressed the need of such organization.



## Science on the Farm

### NITROGEN-GATHERING BACTERIA

Clovers do not take nitrogen from the air when enough to supply the plant is present in the soil. Here is the root of much misunderstanding. A farmer was told tubercles were found on the roots of all leguminous plants. He investigated and found no nodules, and immediately charged science with being faulty. His soil was rich, contained plenty of nitrogen, and there was no cause for the growth of nitrogen-gathering bacteria on the roots. No one knows why the small bunches of bacteria attach themselves to clover roots. It has not been determined how the bacteria take the atmospheric nitrogen and make it available for plant use. Nevertheless, it is a fact proved by experiments that the little, microscopic organisms—too small to be seen by the naked eye—act as a kind of pump, gathering the colorless, tasteless, odorless nitrogen from the air and introducing it into the roots of the clover, whence it is transferred to the leaves. Three-fourths of the nitrogen of clovers is in the leaves. The roots of clover plowed under add very little nitrogen to the soil. The increase in crops following clover is due to the humus added by the decaying roots containing plant food made available. The nodules may add some nitrogen to the soil when decay takes place, but the amount is nothing compared to that passing thru them up to the leaves. The air is composed of three-fourths nitrogen and the cheapest way to get it into the soil is by plowing under legumes. One good clover crop returned to the soil—the seed may be saved—every four years will keep your farm supplied with nitrogen, the most expensive plant food element.—Minnesota and Dakota Farmer.

### WHAT BECOMES OF THE FERTILITY.

When the old men of today were boys, especially those who were brought up in the Mississippi Valley, little was said, or known, or cared about fertilizers. The virgin soil was naturally fertile, and there was so much of it that when the crops showed signs of failure in one field a new one was taken in.

But conditions are different now, and fertility must be maintained by restoring what is taken away. It still remains a fact, tho, as we have said in other issues of this paper, that of the ten recognized elements of plant food, only three have shown any sign of exhaustion in the main farming re-

gions of this county, and these are potassium, nitrogen and phosphorus. What becomes of these elements, and how may they be restored? These are questions of ever present importance to the ambitious, progressive farmer, and upon the knowledge implied in the first, and the working out of the answer to the second, depends the success of agriculture.

Fifty bushels of corn drains from the soil that produced it 35 pounds of potassium, 74 pounds of nitrogen, and 12 pounds of phosphorus. Twenty bushels of wheat absorbs 20 pounds of potassium, 52 pounds of nitrogen, and 13 pounds of phosphorus. Four tons of clover requires 16 pounds of potassium, 174 pounds of nitrogen and 32 pounds of phosphorus.

There is no occasion for alarm at the high nitrogen requirement of clover, for in the air or atmosphere there is an inexhaustible supply of nitrogen, and clover, in common with all leguminous plants, draws nitrogen from the atmosphere, and some way by means of bacteria that live on the roots, adds it to the soil in which it grows, even more than it requires, and leaves the soil richer in nitrogen than it found it.

Another fact that enters into the solution of the problem we are considering is, that two-thirds of the potassium drawn from the soil by the growing crops is in the straw, the remaining one-third being in the grain. If the grains are fed on the farms that produced them, three-fourths of that third may be restored to the land from which it was drawn by returning to it the manure from the animals that consumed the grain, three-fourths of the potassium in the grain being cast off with the manure. If both straw or stalks and grain be thus utilized and returned to the soil, two-thirds and three-fourths of one-third of the potassium is returned with it, one-twelfth only of the potassium being lost. In practice, however, these exact proportions cannot be restored. There must be some waste, and consequently greater loss of potassium.

With phosphorus it is different. Two-thirds of the phosphorus is in the grain. Therefore, to grow heavy grain crops, either of corn, wheat, oats, barley or other grain, the soil must be rich in phosphorus; and it is a fact that most of our agricultural lands are poor in phosphorus, and that is why the grain crops so rapidly exhaust those lands.

And even if the grains are fed on the farms and the manure used, three-

fourths of the phosphorus, *instead of* being held in the manure as in the case of potassium, is bone material and becomes a part of the living animal. Hence very little phosphorus is ever restored either in the straw or stalks or the manure.

To summarize: The soils are naturally fairly rich in potassium, and that element may be quite effectually returned in the straw or stalks and manure. The supply of nitrogen is abundant in the air, and may be drawn therefrom by leguminous crops, and given to the soil. Our lands at best are not rich in phosphorus, and no system of farming can very well restore what phosphorus is drawn from it. Phosphorus, therefore, must be restored by other means, among which we may mention bone meal, acid phosphate, and ground phosphate rock. The latter, perhaps, is most available and cheapest. It contains the phosphorus in the farm in which it is found naturally in the soil, and exhaustive experiments have proven its effectiveness. It should be ground very fine, and be evenly distributed, from 500 to 2,000 pounds to the acre. An excellent way to apply it is to mix it with barnyard manure in the proportion of 40 pounds of finely ground rock to a ton of manure, being thoroly and evenly mixed and applied with a spreader. Forty pounds of ground rock to a ton of manure strikes us as being a very light mixture, but experiment station people pronounce it effective. The greatest general farm trouble is the scarcity of manure, which necessitates the application of the ground rock alone.

We may add the following comparison of fertilizers and their usual cost: Raw bone meal 180 pounds phosphorus to the ton, \$30; steamed bone meal 250 pounds phosphorus to the ton, \$28; acid phosphate, 125 pounds phosphorus to the ton, \$15; raw ground rock, 250 pounds phosphorus to the ton, \$10.—Up-to-Date Farming.

### CONCRETE FENCE POSTS

Concrete—cement, sand, gravel, and water combined in proper proportions—has become one of the leading building materials of the day. It has shown its worth as a substitute for wood; houses built entirely of cement, the trimming and supports of wood being merely for

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decorative effect; it is used by the government, by railroads, by farmers in hundreds of ways, either alone or reinforced; and has been found to produce even good fence posts. Its moderate cost, its durability, the ease with which it is handled, the wide distribution of the sand, gravel, and stone of which it is composed, commend it to the consideration of all builders.

As a material for fence posts concrete has been found to possess but few of the disadvantages of wood, to have practically all its advantages, and to be superior in some respects to timber. Of course, the first cost may be more or less than the best wooden posts, but that depends on local conditions—the timber supply, the deposits of sand, gravel, and rock, and the skill of the workman. If manufactured as usual and cured for three months concrete posts are as good as the best wooden posts. After three years wooden posts possess only one-third to one-half of their original strength, whereas concrete grows stronger with age and needs no repairs as neither weather nor fire injures it. Under ordinary circumstances concrete posts will last forever; and even if in the course of years a few should be broken by unusual strain, it is cheaper to replace them than to replace an entire fence of decayed posts with a material with the same lack of durability.

Concrete posts are attractive in appearance because of their uniform size and color, and can be made either square, triangular, or round, either straight or tapering towards the top. They can be purchased from dealers or made at home, and this latter plan together with suggestions as to the construction of the fence after the posts are made and cured is the theme of Farmers' Bulletin No. 403, recently issued by the U. S. Department of Agriculture. The author takes up in detail the selection of sand, gravel, crushed rock, and cement; the choice of molds—either steel or wooden, and if wooden, the proper way to make square or triangular molds. Reinforcement—the insertion of steel rods or wire in the molds when making the posts, is discussed as to the principle involved and the kinds of reinforcement best suited to certain needs. The work of mixing, molding, and curing is explained with minuteness, and the variety of styles which can be produced described. Under "fence building" is given instruction as to setting the posts, attaching the wire, stretching the fencing, and the use of line anchors. Nine illustrations give detailed drawings of molds, methods, and results. The pamphlet closes with a warning to persons intending to buy post molds, either steel or wooden, to beware of traveling agents who are selling molds or rights for

the sale or use of their respective molds. No dealings should be had with these agents except when fully satisfied thru reports from one's banker or lawyer that the company represented by the agent is reliable and that the agent is their authorized representative. Patents have been issued on special types of reinforcement, and they can not be generally used without danger of infringing patent rights; but none of the simple forms described in the bulletin is patented or patentable, and they are just as good as the special forms advertised and recommended by the agents. No one need hesitate to use the simple form of construction recommended, for it has been in common use in all countries for a number of years, and all claim that the general use of reinforced concrete fence posts is controlled by patent rights are unjustified and untrue.

#### CORN GROWING

By Prof. J. H. Shepperd, Dean, North Dakota Agricultural College

A cultivated crop in the system of small grain farming has become a necessity. It takes a comparatively short time for the weeds which thrive in a particular grain to secure a very tenacious hold on the land. A change to a cultivated crop successfully eliminates them with the exception of a few very persistent ones, and those it cripples badly.

Even on land which is free from weeds, the growing of corn or potatoes make a marked addition to the yield of wheat or flax, for the two years following the corn. A noticeable increase in yield is obtained on the third year following the corn crop, and the three seasons' returns together greatly add to the income of the land.

In crop production one or two added bushels of wheat represent almost clear profit, as the cost of production for the yield of 15 bushels is nearly as great as that of a crop of 18 bushels.

Corn offers an excellent place for stable manure to be worked into the soil thru its cultivation and growth. Manure helps it rather than hinders,

as it might on some of the other kinds of grain crops.

Corn is a heavy yielder of roughage and carries considerable grain in addition. It can be used to carry the farm horses thru the winter as it is usually clean and free from dust, making it about as good for live stock as hay. On the Chicago market shredded corn fodder in bales sells for the same price as timothy hay, which is a very good measure of its feeding value.

Fodder corn can be used satisfactorily in warming up grass fat cattle, that is, carrying them until some time in December, when they can be sold as feeders on the market, and at a considerably better price than they would have brought at the time grass fat cattle were crowding the market.

No season is so poor for corn in this state that it will not reach a stage of maturity, which will enable the farmer to use it for carrying steers to a stage of good feeders in the month of December. On the average season the right varieties of corn will mature enough to enable the feeder to ripen up or fully fatten his steers ready for market.

A few people have used sheep in harvesting their corn crop and by this means secure it with very little expense for harvesting or feeding. They accomplish the results by having a flock of sheep herded in the corn, it is not fenced, or simply turned into it if it is. The sheep take the corn from the stalks as it stands in the field and on account of their liking for a great variety, consume husks and blades very freely, in addition to the ears

### HOTEL VENDOME MINNEAPOLIS

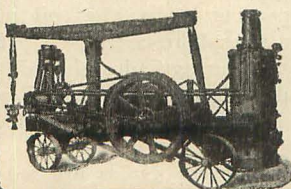
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of corn. The sheepmen commonly run their sheep in grain stubble and allow them to glean unharvested heads, pick up the weed seed, etc., before the corn is ready to pasture off. They seem to thrive as well if not better on soft corn, than they do on that which is fully ripened, so that a short season or one with early frosts is no disadvantage to the sheep growers, who want to feed off standing corn.

The dairyman commonly builds a silo and puts the corn into it at the glazing stage, and by this means produces a very high grade of winter roughage. A few of them who cannot afford silos, and a majority of the beef producers, cure this fodder and feed it either from the stack or from the shock during the winter. In a few cases I have known people to pasture off the corn with cattle and with hogs successfully, altho the majority believe this plan to be wasteful.

I believe the facts I have here given above will be sufficient to convince any fair minded man that corn should be grown in the rotation in this state, and that it can be utilized in such a manner as to more than cover the cost of growing it.

In planting corn I would put it on fall plowed land, which has been manured before plowing if possible. I would recommend putting it in with a planter in hills after the fashion known as check-rowing. The majority of the people do not keep the weeds out of the corn well enough to get good results, and when it is in hills so which allows cultivation only one way. Corn should be harrowed frequently until it is about five inches high. The crop will look like it is being ruined by the harrow and some stalks are torn out and killed, but since the harrow covers all of the ground and goes thru and around the hills of corn, it destroys the weeds so thoroly that the yield is usually much greater than where the harrow is not used on the crop.

The weeder does somewhat nicer work than the harrow, as the teeth are smaller and the pressure can be regulated instead of being constant and often rather heavy. Frequent and thoro cultivation after the harrow is all that is required to produce a good field of corn and the yields of small grain which I have described as following it.

#### CARE OF DRY-FARMING SOILS

Dry farming is made possible in two ways: (1) By careful tillage and (2) by introduction of drought-resisting crops or drought-resistant varieties. Even where farming is followed, irrigation is usually recommended for the small

areas to be devoted to garden crops to carry the household thru years of crop failure, which are more frequent in these semi-arid regions than in regions where the rainfall is greater.

The principles of tillage are almost exactly the same as for other regions, or even for the semi-arid regions where irrigation is practiced, with emphasis laid upon the conservation of moisture: (1) Because the supply is low and (2) because one and one-half times as much water is required to produce a pound of dry matter in the plant in these dryer regions as is required in more humid climates.

Surface cultivation is constantly resorted to in order to maintain a mulch or lid to prevent the escape of moisture and to keep down weeds, which drain the land of its water. This mulch is renewed as soon as possible after each rain, but should not be made sufficiently fine to allow the wind to blow the soil from place to place. This is especially to be guarded against on sandy soil, which should be worked sooner after rain has destroyed the mulch than the clay soil, which is more inclined to puddle, bake or otherwise get out of good physical condition. The third advantage arising from frequent surface cultivation is the admission of air to the roots of the crops, supplying them with oxygen. This air also encourages the growth of the friendly bacteria which prepare plant food by breaking down humus and forming the nitrates which can be readily taken up by the roots of the plants.—Farmer's and Drovers' Journal.

#### DEMONSTRATION FARMS AND STATIONS 1909

##### A Representative Report Portland Junction, Traill County Elevation 1068 feet

The land selected for this demonstration farm is a level tract containing a few shallow depressions. It was located three miles west of Portland Junction and five miles south of Hatton in Traill county. The soil is a clay loam with a yellow porous clay sub-soil, so characteristic of the western half of the Red River Valley. The depressions were a little too low to produce a good crop in wet years like the 1909 season. This farm was also struck by hail on July 1, which injured the growing crops to quite an extent.

This land was broken up in the summer of 1885 and had been cropped ever since with small grain continuously, nearly always wheat, with a very limited number of crops of oats and barley. During this time one crop of flax and one of millet had been produced.

This land had never grown a cultivated crop, nor had it ever received any manure or other fertilizer. The land is thoroly infected with wild peas and wild oats and also contains some yellow mustard. The problem here is how to grow maximum grain crops and at the same time increase the soil fertility and eradicate the different weed pests. By growing clover one year in six and by manuring one field and growing corn on it every six years, together with good thoro cultivation, this end should be attained by the following six year rotation, which was put in operation:

Plot No. 1.	Plot No. 4.
'09 wheat	'09 corn
'10 barley and clover	'10 wheat
'11 clover (to be manured in fall 1911)	'11 oats
'12 corn	'12 wheat (to be manured fall 1912)
'13 wheat	'13 barley & clover
'14 oats	'14 clover
Plot No. 2	Plot No. 5
'09 oats	'09 oats & peas
'10 wheat	(manured fall 1909)
'11 barley and clover	'10 corn
'12 clover (to be manured fall 1912)	'12 wheat
'13 corn	'13 wheat
'14 wheat	'14 barley & clover
Plot No. 3	Plot No. 6
'09 wheat	'09 barley & clover
'10 oats	(Manured spring 1909)
'11 wheat	'10 clover (to be manured fall 1910)
'12 barley & clover	'11 corn
'13 clover (to be manured in fall 1913)	'12 wheat
'14 corn	'13 oats
	'14 wheat

Plot No. 1—Common Fife Wheat. The west half of this plot was fall plowed and the east half was plowed April 28. This field was harrowed on the 29th and seeded May 3 at the rate of  $1\frac{1}{4}$  bushels wheat and 2 pounds medium red clover per acre. This field was harrowed twice after seeding on May 8 and 13. This crop made a good growth all summer owing to the wet conditions of the land. This was greatly aggravated by the hail storm which struck this farm on July 1. The crop was cut August 17 and yielded 7.20 bushels per acre. The land will be spring plowed and put into North Dakota Station No. 871 Mandscheuri barley and medium red clover next spring.

Plot No. 2—White Russian Oats. This plot was all fall plowed except a twenty foot strip on the west side, which was spring plowed on April 28. On the 29 this field was harrowed once. May 4 it was seeded at the rate of 2 bushels oats and 2 pounds of medium red clover per acre. It was harrowed twice after seeding on the 8 and 13 of May respectively. The oats made an excellent growth all summer. Tho injured by the hail to some extent they made a fine even stand,



60 inches in height at the time of cutting, August 20. The yield per acre was 46-56 bushels, which is quite satisfactory. The land was plowed November 11 and next year this plot will be seeded with Minniesota No. 169 blue stem wheat.

Plot No. 3—Common Fife Wheat. This plot was all spring plowed April 28, and subsequently received exactly the same treatment as Plot No. 1 except that it was cut two days later. The crop growth was practically the same as Plot No. 1 and the yield was the same. This field was plowed November 11 and will be seeded with White Russian oats next year.

Plot No. 4—Mercer Flint Corn. This field was spring plowed to a depth of six inches. It was harrowed May 13 and seeded on the 14 in check rows 42 inches apart with five to six grains per hill. The crop was harrowed two times after seeding on May 21 and June 4. It was cultivated five times on June 17, 22, July 5, 16, and 22 respectively. The corn came up well shortly after seeding and made a fine growth all summer. It matured well and was cut September 17 with a corn binder. The stalks were about 60 inches in height and the ears were long and well filled. The yield was 4950 pounds of fodder per acre which was picked and yielded 43.40 bushels of shelled corn per acre; the largest yield of shelled corn of any plot of corn in 1909. This plot will be double disced next spring and will be put into Minnesota No. 169 blue stem wheat.

Plot No. 5—Oats and Peas. This plot was all fall plowed with the exception of twenty feet on the west side, which was spring plowed April 28. It was disced and seeded with  $1\frac{1}{2}$  bushels Canada field peas per acre on May 4 and three days later  $\frac{1}{2}$  bushel of oats was seeded per acre. It was harrowed twice after seeding on the 8 and 13 of May. The oats and peas got a good start, but the season was too wet for the peas and they made a poor stand. On July 14 the oats were doing well; they were 20 inches high and heading. The peas were much shorter and were in bloom. This crop was cut August 2 and yielded 2205 pounds of fine hay per acre. The plot was manured in October and was plowed November 12 to a depth of six inches. Next year this field will be seeded with Mercer flint corn.

Plot No. 6—North Dakota Station No. 871 Mandscheuri Barley and Medium Red Clover. The west half of this plot was fall plowed and harrowed May 4. It was all manured during the spring at the rate of ten loads per acre; this work was finished May 10. The east half of the plot was plowed May 12 and the entire plot was harrowed on the 12 and seeded on the 13 of May with  $1\frac{1}{2}$  bushels of barley and 15 pounds of

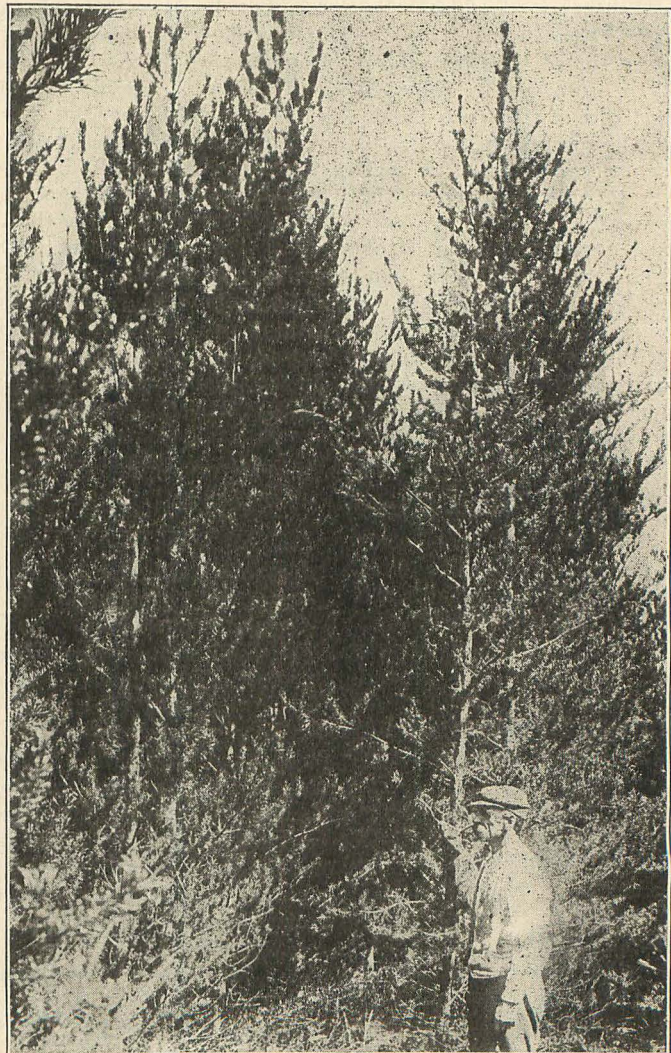
medium red clover per acre. Both crops got a good start but the barley suffered severely from the wet condition of the soil in June and the hail July 1. The barley was much better on the fall plowing and the clover was best in the spring plowing. The barley was 36 inches tall when cut on August 3, but the heads were very short and the straw was spindly.

This farm was tile drained in November; the ditches for the tile were dug as soon as the crop was off, but the tile did not arrive for over two months afterward. This accounts for the late fall plowing on this farm; the plots could not be plowed until after the tile was laid on account of the open ditches. This method of drainage ought to greatly improve the demonstration farm and

## JACK PINE PLANTATION

(*Pinus divaricata*)

This photo shows part of the experimental plantation designed and established by B. E. Fernow when chief of the Forestry Division, U. S. Department of Agriculture. Many different species were planted, but Jack Pine did best of all.



This plantation is on very sandy land, where the sand drifts when sod is broken. The plants, when set, were seedlings about ten inches high. They were supplied by

H. B. AYERS, of Kimberly, Minn.,

who now has a nursery devoted exclusively to the propagation of Jack Pine for prairie planting.



with the rotation used, with good seed and good careful tillage, this farm should produce the heaviest crops of any of the twenty-one demonstration farms now in operation, as well as be a very valuable object lesson to the farmers in its vicinity.

#### Edgeley Sub-station Report

The seventh annual report of the Edgeley Sub-Experiment Station has just been issued. It gives much information that is of special value to a large portion of the state of which the conditions at Edgeley are characteristic. It opens up with a general discussion concerning buildings and equipment. It then takes up the subject of fruit growing. Of apples, they are placed in the following order as to hardiness; Hiberna, Patten's, Greening, Lyman Prolific, Wealthy, Virginia Crab, Transcendent, etc. Of plums, the hardiest are the Coole and DeSota, and others are mentioned. Cherries have not proved hardy. Of currants, the following have done well: Improved Red, Red and White Dutch, Fay's Prolific, White Grape, Red Cross and a few others. Of Gooseberries, the Champion, Downing, Red Jacket, Houghton, Carrie and Pearl have proved hardy and productive.

Experiments have been carried on with shade trees. Trials have been made with planting southern grown nursery stock in comparison with northern grown with the result that the southern grown practically all killed out while the hardy northern stock has

given excellent satisfaction. The trees that have done best are also mentioned.

A great many of the grains were experimented with, and they were all sown on land that had been in corn the year previous. Of the 34 varieties of wheat experimented with the Durum wheat, Pererodka gave a yield of 30.3 bushels. The highest yielding Fife was Powers Selected with a yield of twenty-one bushels. American Blue Stem yielded 20.9 bushels. In the seven year trial with wheat, the Arnautka gave an average of 26.26; Rystrings Fife 15.76. The statement is also made that the Arnautka strain of Durum wheat yields highest and also that it has been more rust resistant than any other Durum wheat and much more so than Fife and Blue Stem.

Thirty-seven varieties of oats were tried. Of these No. 617 and the Sixty Day each yielded 68.8 bushels per acre, while the Siberian White yielded 65.9. In the seven year test the Siberian White gave a yield of 55.11 bushels.

Thirty-seven varieties of barley were tried. Of these the Mariout yielded 43.2; the Gai-to-mi 42.8; Black Hulless 36.7 bushels; White Hulless 31 and Boehms Hulless 30.7.

Of potatoes Rose of the North yielded 129.3, Maules Commercial 118.9. In the five year test the Daughter of Rose gave a yield of 118.9, and Rose of the North 115.7.

Of winter rye No. 1134 gave a yield of 28.2 bushels.

Of corn, Mercer Flint and N. W. Dent each gave a yield of 28.8 bushels.

Of the millets, the Red Voronezh gave a yield of one and two-thirds tons per acre.

In an experiment as to the best amount of seed to sow, it was found that the best yield of Durum wheat was secured when nine pecks are sown per acre. Of the Fife wheat, two bushels; of oats, eight, ten and eleven pecks gave the same yield; of Barley, six pecks.

The Gimm alfalfa proved the hardiest.

This work was conducted by C. A. Thompson assisted by Clarence Path of the United States Department of Agriculture under the direction of Dean J. H. Shepperd and in cooperation with the United States Department of Agriculture. This bulletin can be secured from the Agricultural College at Fargo.

#### Williston Sub-station Report

The second annual report of the Williston Sub-station is in press and will be out in a few days. Williston is in a section that has been regarded as one of the drier parts of the state, and was for a long time considered as being fit only for ranching. This report will signify in how far this idea is correct. So much interest has centered in this section that the Department of Agriculture at Washington have detailed several of its men to pay especial attention to the problems here.

Considerable work is being done on plant breeding both with the centgener and row systems. For 1909 the average of the Durum wheats was 36.3 bushels

## Graders are at Work

On the C. N. cut-off, Fargo-New Rockford-Minot, which will pass about 13 miles south of here. ¶GRADERS ARE ALSO AT WORK on the Soo's new cut-off, Drake-Devils Lake-Medford, which will pass about 8 miles north of here. ¶And just this week surveyors are at work on a line to extend this Esmond branch, presumably to Towner. All THREE new lines will run clear across southern Pierce County, which heretofore has had rather inadequate railroad facilities.

## Think of Effect on Farm Land Values There!

Seven grain elevators at Esmond, N. D. Proof of the wheat-producing powers of the vicinity. One million bushels of grain marketed annually, in this 8-year-old town. Tributary to Esmond is to be found the cheapest good land in the state of North Dakota. Watch rapid increase of values and prices of farm lands here, when Great Northern cut-off, Fargo to Minot, via New Rockford, is built, as expected, in 1910. Choice improved and unimproved farm lands for sale. For prices and particulars write

**STYLES & KOFFEL, Esmond, North Dakota**



per acre, Kubanka leading with a yield of 39.1. Of the Fife wheats the average was 31.8, Canadian leading with 32.4. The average for the Blue Stems was 34.4, Haynes and Marvel each yielding 35.9. Of the 21 varieties of oats, the Siberian White and G. I. 492 each yielded 104.1 bushels, Golden Cluster following with 104 bushels. Of barley, the Russian yielded 57.8 bushels, White Hulless 33.3, Emmer 56.9. Flax, N. D. Experiment Station No. 67 yielded 23.5 bushels. Spring rye, 40 bushels. Potatoes, Early Russett, 163.2, Pingree 151.2.

There was also an experiment on irrigating wheat. The irrigation resulted in an increase of 4 bushels per acre. These yields that have been reported were secured without any watering. This is a very small increase as watering has resulted in a much more marked increase in Wisconsin. In the experiments with winter wheats, some winter killed. The N. D. Experiment Station No. 117 gave a yield of 53.7 bushels.

Experiments were also conducted on

the depth to plant potatoes. Those planted at a depth of 4 and 8 inches gave an equal yield. In the experiment as to distance apart to plant the highest yield 186.2 bushels was secured by planting in rows 2 feet apart and hill 9 inches apart in row. With irrigation the yield of potatoes was increased 40 bushels. Experiments were also conducted with sugar beets, legumes, forage crops, alfalfa, field corn, field peas, rotation of crops, movement of moisture in the soil, trees, and fruit. The bulletin is also illustrated.

These experiments were carried out by E. G. Schollander under the direction of Dean J. H. Shepperd and in cooperation with the Department of Agriculture. Babcock, Whitcomb and Hawley have all been detailed by the U. S. Department of Agriculture to co-operate in the work. They represent the Bureau of Plant Industry and the Irrigation Investigations.

The bulletin can be had by writing to the Agricultural College, Fargo.

yet been able to get more absolute figures concerning the conservation of soil moisture, but we do know that moisture can be greatly conserved by the addition of well rotted manure, by deep plowing at the right time, by packing the subsurface, by frequent surface cultivation, and by top-dressing with manure.

The addition of humus also helps to keep the soil in good physical condition, and adds considerably to the plant food. Humus also has the power to make available large quantities of plant food that were previously stored in the soil in a form unavailable to the plant roots, and humus is a suitable medium in which beneficial soil bacteria increase in numbers. Looked at from any view point, there is hardly a more important problem connected with soil management than the maintenance of its supply of humus.

#### DURUM WHEAT AS A DRY FARM CROP

By M. A. Carleton, Cerealist in Charge,  
U. S. Department of Agriculture

## Soil Moisture and Humus

By J. C. McDowell, Assistant Agriculturist, U. S.  
Department of Agriculture, Waukesha, Wis.

Two year ago this summer, as I traveled over the central part of North Dakota making a preliminary agricultural survey of that section for the United States Department of Agriculture, I gave particular attention to the moisture holding capacity of the soils. Early in July of that year the crops all looked well and appeared to have plenty of moisture, but by the middle of July there were large areas where the dry weather and hot winds had taken almost all the moisture out of the soil. As I drove along one day during this drouth, I noticed that the wheat, corn, potatoes, and all other crops were withering rapidly under the scorching heat of the sun and the hot, drying wind. For miles and miles it appeared as tho there was no chance for any of the crops to recover. Imagine my surprise as one day I passed a well kept farm on which all the crops were green, and on which even the pastures seemed to have plenty of moisture.

I was so surprised and pleased with what I saw that I drove in to meet that farmer and to study the system of farming that had brought about such results. I wanted to find out what this farmer was doing that his neighbors were not doing. His solution of the problem was very simple. On a farm of moderate size he kept over a hundred head of livestock, and by so doing he was able to keep his soil rich in humus. He went all

over the farm with me, and we examined the soil in all the different fields. Everywhere the soil was full of organic matter, and everywhere it was well supplied with moisture. On close examination I could not discover that any of his crops were suffering from the drouth, and I afterward learned that he harvested a big crop that fall.

Just before I left his farm he said to me, "You know the farmers all over this western country say that you must not manure the soil, because if you do you will dry it out. I am putting into my soil all the manure I can get hold of and you notice the results." I noted the results on his farm and I have seen similar results since as I have traveled over North Dakota and other states, but I do not know that I have ever seen the contrast quite so marked as on that hot day in July in 1908.

From observations made during my travels this year in the drouth stricken areas of the middle west I cannot help but feel that our systems of farming that allow the humus of the soil to run low are, in large measure, responsible for the injurious effects of the drouth. I have taken the trouble to look up the experimental data collected by some of our experiment stations along this line, and I find that the results of these investigations indicate that soil humus helps greatly in the conservation of soil moisture. It is unfortunate that we have not

As to the amount of wheat that can be handled, there is no question that a considerably larger amount of the wheat can be readily marketed than has ever been grown. There is good reason, therefore, from this standpoint for increasing the production. Each year the supply is not sufficient to meet the demand. This, of course, is largely because of the great amount exported. Some have remarked that the export is now likely to decrease because of the larger production of this kind of wheat in other countries. It may be noted, however, that the domestic use of the wheat is continually increasing and during the past year has increased more rapidly than at any other period. About twenty important flour mills in the country are now grinding this wheat every year, some of them using for this purpose their entire capacity the year round. The names of these mills will be given at any time to the parties individually or commercially interested. They include some of the largest milling firms in the world. This list too covers probably not more than half the entire number of mills in the country using durum wheat, but simply gives the extent of our own information in the matter.

In view of the fact that durum wheat is so admirably adapted to semi-arid districts and must be grown without irrigation to give best results and at the same time has received opposition from mills in certain quarters, it will be important to give the following facts with respect to it, which are obtained from actual experiments either by this department or by millers and bakers using the wheat and flour.



1. The export is now about 20,000,000 bushels per year, a large part of which goes to central and northern Europe for bread-making. The amount being used for bread increases each year.

2. There is an unmistakable increase in the use of durum wheat flour in this country each year for bread, a very large proportion so consumed being ground by Minneapolis and North Dakota mills.

3. In respect to every objection made by millers and bakers to this wheat, when the wheat has been properly handled it has been found that such objection is not well founded.

4. Even the objection of the stronger color in the flour and bread is almost entirely overcome by many bakers in their method of handling the dough.

5. The size of the loaf also, which is smaller than that of loaves produced ordinarily from other flour but which is purely a mechanical matter and of value only to bakers, allowing them to sell that much more air than bread for the same price, is largely controlled also by the same methods that modify the color. On the other hand the advantages are:

6. Unquestionably a better flavor in the durum wheat flour.

7. Durum wheat bread, being more moist, will remain fresh half as long again as bread from other wheats.

8. The baker can get many more loaves of bread from one barrel of flour because of the greater absorption of water, so that he can sell more water at the same price in durum wheat bread if he cannot sell so much air.

9. The baker also makes a saving of a considerable amount of sugar per day in his regular baking in using durum wheat flour, as a prominent baker has stated that no sugar is needed in making this bread because of the large amount naturally found in the flour.

The above points mentioned are in respect to the commercial side of the subject. As to the adaptation of durum wheat as a crop to the semi-arid districts, this has been thoroughly demonstrated for many years. Durum not only gives uniformly a yield of from thirty-three and one-third to fifty per cent greater than that of other wheats under the same conditions in such areas, but will even produce a crop when other wheats practically fail. The present production of durum wheat is probably somewhere near 60,000,000 bushels per annum, about 50,000,000 of this amount being produced in North Dakota, South Dakota and western portions of Minnesota and the other 10,000,000 in western portions of Nebraska, Kansas and Oklahoma, in the Texas Panhandle, eastern Colorado and scattered localities over the Rocky Mountain and Pacific coast regions. Probably fully two-thirds of the acreage of durum wheat is in locali-

ties where, on an average, other wheats would be a failure. There are, therefore, about 40,000,000 bushels of wheat added yearly to the total production in the United States by virtue of the introduction of durum, which was accomplished in the year of 1900.

Altho durum wheat is now a thoroughly established crop both agriculturally and commercially, its introduction has been attended with many difficulties, and, unfortunately, these difficulties have been unwittingly brought about at times by the friends of the wheat. For example, it is extremely important to grow durum only where the rainfall is, on an average, at least below twenty inches per annum. If the soil is sufficiently retentive of moisture fifteen inches is sufficient for a good crop. Where the rainfall is greater than twenty inches there is certain to be a deterioration in the quality of the kernel, more so than in other wheats, but because of the great yielding power of this wheat enthusiastic farmers have grown it where it should not be grown and have thus injured the reputation of the wheat. It is, therefore, also true that durum wheat should never be irrigated. In many cases under experiment durum wheat when irri-

gated and grown on lands similar in every other respect to that where there was no irrigation has furnished samples of wheat so very different from the other that they could not be identified by ordinary parties as being the same wheat. Also durum is strictly a spring wheat under ordinary conditions and, therefore, cannot be grown profitably in the South, unless sufficiently far south to be sown in the fall or mid-winter without injury by cold weather. An effort is now being made by the department to develop a winter variety of durum with already partial success, but from three to five years will probably yet be required to establish such a variety. Durum should be kept constantly free from other kinds of wheat, no more because of injury to the other wheat, however, than because of injury to the durum. Importers will promptly refuse durum wheat that has any considerable mixture of common wheat.

There are several varieties of durum but the most common one grown in the United States, and by far the best for bread-making, is the Kubanka. Teh names Arnautka, Wild Goose, Beloturka, and Nicaragua are synonyms.

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# North Dakota Farmer

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## SHORT WEIGHT

The Food Law in North Dakota requires that each and every package or container shall show thereon the true net weight. The National Law is defective in that it does not require the net weight.

In speaking of this matter an editorial in the American Grocer says:

"Short weight containers are the tools of the trickster and they ought to be stamped with the exact weight or measure of their content."

Simply because it is a matter of long standing is no reason why the fault should not be corrected, for the same paper says, "Tricksters are short-lived. They do not belong to the class of men that establish a business on a foundation that stands. They are the enemies of the trade as well as the people."

Commenting on the information that has come to him under the workings of the National Food Law, Dr. Wiley has confirmed the stand which this department has taken in the enforcement of our state law with regard to the matter of short weight packages. He says:

"Many thousands of packages have been weighed since the beginning of the enforcement of the food and drug act which presumably were put up to represent a given volume or weight. It is a common practice to make bottles which appeal to the purchaser as quarts or pints, and cans which appeal to the purchaser as pounds and half pounds, and likewise gallons and half gallons, and other standard weights and measures. Often there have been found upon these packages a direct statement that they contained a given amount of volume, at other times such a statement

has not been made, but the packages have been sold with the understanding that they have a certain definite weight or volume. This is true particularly in the case of loaves of bread, large numbers of which are purchased under the supposition that they contain a pound, but are found to be from two to three ounces short in weight. A conservative estimate of this shortage in weight would not place it below 15 per cent, and probably even higher. This is a direct tax upon the consuming public, where they pay for food they do not get. The most stringent laws, both national and state, should be passed to control this wholly artificial and unnecessary increase in the cost of living. Under the present food and drug act the only measures that can be taken are in those cases where the weight is stated falsely on the package. If no weight is stated, even if the package be understood to be a definite weight or measure, under the law no action can be taken."—(Special Bulletin N. D. Pure Food Department.)

## QUANTITY VS. QUALITY

One is often made to feel that with the tendencies of the present commercial age manufacturers have come to sacrifice quality in order that they may produce quantity. Individual laws for the protection of the public dealing with foods, drugs, patent medicines, paints, feeding stuffs, fertilizers, etc., are good as far as they go, but what is needed is a law which will cover all classes of products; a law which makes it illegal to falsely label a product; to falsely describe by word of mouth or otherwise any article of commerce to be sold to the consuming public.

Fraud and adulteration is not now confined to food and food products alone, but covers almost every article of manufacture that comes into the home or upon the farm. The process of cheapening goes on and attempt is made to turn out quantity, quantity without regard to quality. Flimsy pieces of cloth are heavily loaded down with starch or mineral products. Cheap and inferior paper is heavily loaded with stone, made to be sold by the pound but does not last. Clothing is made of shoddy and waste material. Silk in its substitutes and imitations at fancy prices will hardly last until made up.

All classes of products may be subjected to chemical treatment of some kind to make them appear like something else but always to the injury of the same, as in the bleaching of flour which is for no other purpose than to deceive and defraud the public and make the product look like something else.

Cotton is chemically treated and made to appear like silk, linen or wool and

often it is hardly worth the time spent in making up the same. Cotton cloth, when washed, is often little more than the semblance of the product which it seemed to be when purchased, for the loading has been soaked out and only the flimsy material remains.

The everlasting cheapening and cry for quantity, without regard to quality, is lowering the standard of American products, and while it may enable us to compete for a short time with the markets of the world, it does not bring creditor satisfaction or lasting benefit to the nation. It is time there was a general law that would put a stop to the deception now being practiced; that we go back and consider the quality of the manufactured product rather than the quantity produced in the factory.

## THE TRUTH ABOUT PAINTS

As the writer has persistently maintained, the labeling of paints to show their composition and ingredients works no hardship on any honest manufacturer. In fact, the labeling of paints as required by our State law works a distinct benefit to every honest manufacturer as well as a protection to the public.

This fact seems to be brought out by one of the large paint manufacturers, who in their house paper says:

"The passage of the pioneer formula label law in North Dakota did not impose a hardship on a producer of reputable paints but on the contrary showed them up in a better light than before. It did, however, utterly blast and blight any claims that many watered and "doped" paints had for being first class commodities. This is proved by the fact that some of the paints thus exposed have disappeared, others have stopped doing business in that state and others have changed their formulas since the North Dakota Law was passed.

"Instead of the formula law working to the detriment of makers of quality paints it has removed from competition many products which formerly gave a black eye to the very meaning of the word paint.

"The statement is frequently made that the formula means nothing to the consumer; this is not wholly true as any consumer can readily see at a glance that a formula which shows a heavy percentage of water or a preponderance of inert material is an inferior paint. The advertising and educational campaigns of the manufacturers have brought this about and will continue to see that the consumer is educated to realize the value of really dependable paint materials.

"The argument is frequently used that by showing the formula the manu-



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M. V. FACEY, Preston, Fillmore Co., Minn



facturer shows his stock in trade; this in a measure is true but not in its entirety for this reason: that no matter how elaborately a formula may be displayed if the man who tries to imitate it does not put the ingredients thru the same identical process of manufacture he will not be able to duplicate the goods from the formula alone.

"As far as we can see and know after showing the formula label for two years

it is not in any way working to the detriment of the "on the square" manufacturer but on the contrary shows over his name that the material in that sealed package is his idea of what a good paint should be. The person who maintains that he will harm his business by thus showing his brand, we judge, must be making paint on a formula on which he certainly lacks confidence."

hair in the forehead of the bull, the quiet motherly expression of the female, or the lack of these features as the case may be.

In some of the shows where abattoirs are provided and where fat stock classes are included, the amount which animals will dress out, the quality of the meat and the percentage weight of the different cuts are features of the contest. In such classes the real values are determined, but the individual animal is sacrificed for the sake of adding to our sum of information.

#### Dual Purpose Type Not Definite

The judging of dual or general-purpose breeds of cattle has not been generally satisfactory, as should be naturally expected. This is due to the fact that the exact type of this class has not been fully agreed upon and because it is harder to determine an intermediate type than a superlative one. It is easier decided, for example, which is the most pronounced beef or dairy type respectively than to decide twich one is most nearly half way between the two, reaching as nearly to both as possible. The tendency so far has been to favor the beef type of the dual purpose cow, and in consequence the breeders of Red Polls have had to brace themselves against this show ring tendency, while the pressure of popular applause along with the judges' difficulty has all but eliminated the dual purpose Shorthorn from the country by making her beef producing in her tendencies.

It is needless to say that the smaller fairs of the country cannot afford and do not need elaborate systems of callifica-

## Livestock Department

PROF. W. B. RICHARDS, Editor

### THE PRESIDENT HAS A NEW COW

While the President has had considerable trouble in his domestic affairs this spring, having lost his cook and the mooly cow that supplied the White House with fresh milk, Senator Stephenson has come to his rescue and has presented President Taft with the best of his herd of blooded cattle. Pauline Wayne as she is known is a real aristocratic bovine, whose face or rather her face value is her fortune, being set at \$1,000. She comes from a long line of registered Holstein stock and her sleek black and white complexion, the same that has marked her ancestors for many generations, proves her claim of royal blood. Pauline is now being prepared for the journey from Kenosha, Wisconsin, to Washington in a palace car, and will be provided with a special attendant to care for her during the trip.

### JUDGING STOCK AT FAIRS

Prof. J. H. Shepperd in Orange Judd Farmer

Fairs do more to establish the type of a given breed of live stock than any other single feature. The premium awarded at a prominent fair decides whether a sire is popular or not and frequently extends its influence to his entire kinship and to generations of his kind which are yet unborn.

The premium list classification must contemplate and the judge must keep in mind the fact that hereditary principles must be given strong consideration. Grade stock should be shown under fat stock classes and distinct from the registered animals.

Herds shown in competition, usually consisting of a bull and a cow and three heifers—a two-year-old, yearling and calf—is a class where breed and type uniformity, in addition to a high degree of excellence, are features which the classification contemplates and is cen-

tered largely on heredity.

Four animals the get of one sire are calculated to show the strength of the blood lines of a particular individual. Two, the product of one cow, is a class which measures the hereditary strength of the female as a breeder.

#### Fancy Points Show Blood Lines

Breed points which a judge makes much of are centered on his search for hereditary capacity. Frequently a novice is astonished to find that a judge puts so much weight on a strictly fancy point. A fancy point, such as the feather on the Clydesdale, his white feet and strip in his face, have no value in themselves, but they indicate the strength of heredity in the individual, better than almost anything else does. A Clydesdale horse without the feather on his fetlocks could be just as serviceable in every useful point as one with that growth of hair, but it is a breed point that is unmistakable, and if that breed point is present on the Clydesdale and well developed, the horse is likely to have a Clydesdale's disposition, constitution, bone, ambition and other characteristic features which cannot be learned from a casual inspection. All breed characteristics are apt to be much more fully inherited when the breed points are well developed.

Constitutional vigor is another feature upon which a judge lays considerable stress. Many special terms are used to express their judgments on constitution, which is frequently combined with some other feature. Character, as it is called, is really facial expression, produced by bright, lustrous, wide open eyes, short face, correct width of forehead and general symmetry. These combine many features and indicate several different things to the judge. From this inspection he gets a strong impression of breed characteristics, he gets an indication of the feeding capacity of the beast, digestion and assimilation perhaps, he gets an indication of sex characteristics, such as the masculine look and curly

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The Lawrence-Williams Co., Cleveland, O.



tion for their live stock, but some of them certainly need revision. The largest sseer is a relic of the past and should be left for menageries and side shows, as he is not wanted on the market and consequently is not interesting to breeders. The all-purpose or farmer's horse does not meet the horse market requirements and is not commonly in favor.

The premium list could offer prizes for bull three years old or over; two years old and under three; one year old and under two; under one year. Cow, three years old or over; heifer, two years old and under three; one year old and under two; under one year. Herd consisting of one bull, two years old or over; one cow, three years old or over; one cow or heifer, two years old and under three; one heifer, one year old and under two; one heifer under one year old.

Champion or sweepstakes awards can also be gauged according to the interest and finances. Champion male and champion female within each breed should be called for in every classification. If desired, senior champion bull and cow and junior champion bull and heifer in addition to grand champion, may be offered, and they add to the interest.

Premium money for fourth, fifth and sixth places is well, if the fair can afford it, as it will help exhibitors who do not hope to have many first premiums to meet the expense of their attendance with their stock and this will help bring them out.

#### Give Date for Computing Ages

The date for computing the ages of live stock should always be given. The stock shown is usually given as much advantage as possible in calculating ages, by really allowing animals 36 months old to be shown as two-year-olds, those 24 months old as yearling and those 12 months old to show as calves. When the date of counting is named in the catalog or premium list, as is usually done, this manner of calculation is fair to all competitors, altho it frequently confuses visitors who do not understand the basis of calculation.

The plan of awarding prizes for herds is a mooted question. The judge usually faces groups of stock which he has already placed in competition as individuals in the classes and has frequently decided which is the better before he reaches the ring of herds. However, he sometimes finds that his decisions complicate the case. In the aged herd, for example, he may have three young animals superior in the one herd and the aged cow and bull better in the others. If that is the case, he will have to decide how much more weight the mature animals should have. It is a common saying that they should represent half of the weight and probably more stockmen will subscribe to that proposition than

## ST. PAUL UNION STOCKYARDS COMPANY

### Comparison of Receipts and Shipments of Live Stock for June

	Railroads	Cattle	Calves	Receipts			Horses	Total Cars
				Hogs	Sheep			
	C. R. I. & P....	374	127	1339	65	1	40	
	C. G. W.....	1152	1045	3628	978	4	113	
	C. M. & St. P..	3449	1646	12623	2756	69	361	
	M. & St. L.....	1057	709	9037	794		193	
	C. St. P. M. & O	2710	1422	16588	3182	4	396	
	C. B. & Q.....	404	207	1431	731		44	
	M. St. P. & S. S. M.	4420	3749	7639	2215		293	
	Gt. Nor.....	6656	5823	15039	2751	15	517	
	Nor. Pac.....	4620	2131	4638	1674	182	260	
	St. P. B. & T....							
	Driven in.....	727	155	1254	275			
	Total.....	25569	17014	73216	15421	275	2217	
	Increase.....	10962	8337	14016			711	
	Decrease.....				2722	887		
	Jan. 1 to date	132131	54637	373458	146256	2855	11340	
	Increase.....	6320	15942		20170		593	
	Decrease.....			65418		28		
	Average Wts..	703	147	252	84			
				Shipments				
				Hogs	Sheep			
	C. R. I. & P....	2083	77		510	3	63	
	C. G. W.....	2354	178		1995		85	
	C. M. & St. P..	3043	439		117	3	101	
	M. & St. L.....	421	8		121		12	
	C. St. P. M. & G.	1982	1958	187	1385	71	91	
	C. B. & Q.....	4709	142	13267	140	97	282	
	M. St. P. & S. S. M.	586	116	76			24	
	Gt. Nor.....	287	38			21	13	
	Nor. Pac.....	297	167		644	67	22	
	St. P. B. & T....							
	Driven out ....	472	275	47	120	38		
	Total.....	16234	3398	13577	5032	300	693	
	Increase.....	5403	1142	5830			192	
	Decrease.....				7232	591		
	Jan. 1 to date	80079	17899	69566	86696	3169	3900	
	Increase.....		1462		7491	503		
	Decrease.....	6986		24165			188	

### COMPARISON OF THE ORIGIN AND DISPOSITION OF LIVE STOCK

States	Cattle	Origin of Live Stock Received				Horses	Total Cars
		Calves	Hogs	Sheep			
Minnesota.....	16363	13572	53124	10430	24	1523	
Wisconsin.....	3297	2657	5493	4006	2	237	
Iowa.....	194	5	358	28	30	17	
Far South.....	26				20	2	
So. Dakota.....	1958	256	6769	199	18	175	
No. Dakota.....	3355	524	7472	758	13	240	
Montana.....	376				168	23	
Far West.....							
Man. & N. W. T.....							
Far East.....							
Returned.....							
Totals.....	25569	17014	73216	15421	275	2217	
		Disposition of Live Stock					
		Calves	Hogs	Sheep			
So. St. P. Pkrs.	9339	13984	59505	9999			
City & St. Butch.	983	152	234	117		40	
Outside P'krs	23	1648	13287	2250		159	
Minnesota.....	2096	601		381	173	73	
Wisconsin.....	1814	323		698	2	65	
Iowa.....	4363	300		631	5	129	
Nebraska.....	235	133				6	
Kans. & Mo.....							
So. Dakota ....	88					2	



to any other. The uniformity of the herd in type is also a feature which is given various degrees of weight by different stockmen.

OF INTEREST TO EXHIBITORS

Mr. C. M. Fleischer, Secretary of National Association of Live Stock Breeders, Raisers and Shippers, 99 Randolph Street, Chicago, Ill., has taken up the subject with the various Traffic Associations thruout the country, also all railroad companies, of the granting of a flat half fare rate for all exhibitors of live stock at State and Inter State Fairs and Live Stock Shows. At the same time the question of attendants for same will be considered and in the case of states south of the Ohio River special stress will be laid upon the subject of hauling one or more attendants free with stock, also the abolishing of extra rate on special size cars, the extra rates on speed horses, etc. This subject is one of vital importance to the entire agricultural and live stock industry of the country at large and means that if the same is established that the number of exhibitors will be vastly increased, which will also mean largely increased attendance at all Fairs and Shows. Mr. Fleischer states that he has the hearty co-operation of all Secretaries of Fairs and Shows and a very large majority of all the Secretaries of the numerous Live Stock Associations thruout the country. He is preparing a table of statistics showing the enormous interest involved and will submit these facts and figures to the various Traffic Associations and Railroad Officials. Every Exhibitor should heartily co-operate with Mr. Fleischer on this subject and write to him at once, as he is entitled to hearty support on this question.

AN IMPORTANT DISCOVERY

For many years the State Experiment Stations, not to say thousands of live stock growers, have given considerable attention to the injurious effect which often follows the feeding of cotton-seed meal to certain kinds of live stock. The loss which has followed cotton-seed meal feeding, especially with pigs and calves, has detracted greatly from the use which could be made of this exceptionally rich material. The subject has been studied from the standpoint of the

No. Dakota....	22	21	.....	644	21	4
Mont. & West .....						
Far South.....						
Man. & W. N. T. 1 .....						1
Mich. & E. Can. ....					2	1
Chicago.....	2083	106	56	311		77
Ills (ex Chicago) 3125 .....		114				91
Eastern Points 1401 .....					97	45
Returned.....						
Totals.....	16234	3398	13577	5032	300	693

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COGSWELL, NORTH DAKOTA

SHETLAND PONIES. All colors, ages and sizes.  
REGISTERED ANGUS CATTLE. Most popular families.  
HEAVY DRAFT STALLIONS AND MARES. TWO SPANISH JACKS.  
WOLF AND FOX HOUNDS that will catch and kill.  
PET STOCK OF ALL KINDS. PURE BRED POULTRY.

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L. H. WHITE, Prop.

COGSWELL, N. D.

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Hides, Furs and Robes

We tan Horse and Cattle Hides. Skins of all fur animals for Robes and Coats. Oak Harness and Lace Leather. Robes are our specialty. No Complaints. Skilled Labor. Twenty-five years' experience. All work guaranteed. Pay highest market price for Hides and Skins. We keep a line of Harness Leather and Robes for sale. We pay the freight on Green Hides for Robes and Leather. Send for price list and shipping tags.

Lisbon, N. D.

OTTO JENSON, Proprietor.

1910 OFFER

For several years we have been searching for a magazine of national reputation with which we might combine, and in which we might have implicit faith as to its editorial policy and advertising patronage. The Farm Journal, of Philadelphia, Pa., is just such a publication. Its circulation is over 600,000; its class of advertising is beyond criticism. As a general farm paper, it has no superior in the nation. No farmer in North Dakota can afford to disregard our special offer of five years subscription to both the North Dakota Farmer and the Farm Journal, for only \$2.00. Subscribe yourself then pass the word along to your neighbor.

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chemist, the veterinarian, and the animal feeder. The symptoms of affected animals have been observed extensively; and a great variety of feeding experiments have been made with different mixtures and methods of feeding, in the attempt to get a clue to the nature of the difficulty and the practical means of avoiding or overcoming it. At an interesting stage in the study it would be found that the animals did not seem to be seriously affected by eating the meal in considerably quantities, and in certain localities injury was far less prevalent than in others.

This latter fact caused the Department of Agriculture to take up the question under Dr. John R. Mohler of the Bureau of Animal Industry, the laboratory and pharmacological studies being conducted by Dr. Albert C. Crawford. Doctor Crawford finds the poisonous principle to be a salt of pyrophosphoric acid. Small amounts of this salt can be borne, he states, without injury. The amount of the salt which may be permitted in cotton-seed meal should be determined. This discovery has suggested a line of study upon the relation of the character of the soil, etc., to the production of the poisonous body in cotton seed, the part which fertilizers may play, the influence of micro-organisms, and an inquiry as to whether the pyrophosphoric acid is derived from the soil or is due to a physiological process in the seeds.

There seems to be no doubt of the correctness of the results obtained by Doctor Crawford, for not only have elaborate and systematic studies been made in the laboratory, but the Bureau of Animal Industry made a test of the theory by conducting experiments with pigs.

#### LATE SEASON FORAGE CROPS

By Prof. J. H. Shepperd

The hay crop for 1910 is very short and the question now before the stock owners is the providing for winter feed.

Fortunately a dry early season is usually followed by a rainy late season, which gives a chance for late sown forage crops to make a growth.

There is considerable land summer fallowed annually and all such land which has been plowed can now be seeded to corn or to millet and produce a good supply of rough feed for carrying stock thru the winter.

In the season of 1909 I planted corn on a field of ten acres which I had left for fallowing and had plowed and harrowed some time before and got a yield of over four tons of dry fodder per acre on the land. I planted common feed corn on the field in drill rows wide enough apart to be cultivated with a corn cultivator and thick in the row i. e.,

a grain of corn every two or three inches in the row.

This field was planted on the seventh day of July. That land had been plowed and harrowed early in the season and hence was in better shape than most available land will be now, but with plenty of rain, almost any fallow field will give enough roughage to pay well in this year of hay shortage.

Our standard varieties of seed would be too expensive if they could be had. Feed corn is cheap and will answer the purpose provided it will grow.

Do not purchase corn to use as seed without first trying it to see if it will sprout strong. If it does not have good growing strength, it is useless for planting.

Common, German or Siberian millet seed sown at the rate of a half bushel of seed per acre is not expensive for planting and will be likely to supply considerable hay.

Corn fodder makes a splendid roughage for horses as well as for other classes of live stock, while millet furnishes suitable roughage for a part of the ration of cattle and sheep.

There is so little risk that rain will come and start the seed that both crops may as well as planted and ready for rain to start them. If no land is available, except some which must be plowed, it may be necessary to wait for rain to soften the ground enough for a plow to run in it.

This late corn should be harrowed and cultivated regularly until it is too high to run a cultivator thru just as early corn should be treated.

Corn and millet are both hot weather plants and will come on rapidly in mid-summer, if they have an ample supply of moisture.

#### GREATER PROFITS FOR THE FARM

We commend a little booklet containing valuable data and instructions, which will be mailed absolutely free by the American Book Company, Chicago. It treats of the Babcock Test, Silos, Measures, Computations, Feeding Tables and other features of special interest to the farmer boy. A postal is all that is necessary.

When writing advertisers please mention the North Dakota Farmer.

#### GRAND 5-YEAR OFFER, PAGE 20

### CENTRE-LANE STOCK FARM

**BREEDER OF:** Black Percheron and Hambletonian Horses, Red Polled Cattle, Poland China Hogs, White P. R. Chickens, White Holland Turkeys, White Embden Geese, White Pekin Ducks and White Guinea Fowls.

**GROWER OF:** Minnesota No. 169, Spring Wheat, Swedish Select Oats, White Hulless and Success Beardless Barley, Turkey Red Winter Wheat, N. D. 959 Winter Rye, Northwestern Dent Corn, Early Ohio Potatoes, Timothy and Alfalfa.

Young Stock and Pure Seed, for sale. Write me for particulars.

J. A. ENGLUND, Prop.

Kenmare, North Dakota.

The recent sale of blooded stock by J. S. Johnson at Ellendale indicates that the farmers of the state are coming to appreciate good stock. The total sales aggregated \$20,000, an average of \$632 for each animal sold. The highest price paid for any individual animal was \$1,200.

#### 3 PAIRS SHEARS FREE, PAGE 31

### CLASSIFIED ADS.

#### LIVE STOCK

##### HORSES

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Percheron, Belgian and Shire horses  
J. W. & F. T. PETERSON, Litchfield, Minn.

**MEADOWBROOK STOCK FARM.** Clydesdales and Shetland Ponies, imported and home bred. Prices reasonable and terms to suit. Write or come and see me. **GEORGE LANG**, Mapleton, Minn.

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**North Branch Stock Farm.** High class Short-horns. Herd, bull Supreme Judge 177722—pure Scotch, John Donelly, Grafton, N. D.

**REGISTERED RED POLLED CATTLE**  
Young Stock of Both Sexes For Sale.  
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**POLAND CHINA PIGS,** also Shropshire sheep. Seed grain. **GEO. N. SMITH,** Amenia, N. D.

#### EGGS AND POULTRY

**EGGS FOR HATCHING.** Express prepaid, \$2 per 15, from pure bred Golden Wyandottes and White Plymouth Rocks (Fishels strain.) Wyandotte stock for sale. Send for Catalog. C. H. MCGEE, McHenry, N. D.

#### MISCELLANEOUS

**Envilla Stock Farm,** Cogswell N. D. will quote you special prices on Angus Cattle, Shetland Ponies, Duroc Jersey Hogs, Wolfand Fox Hounds, Fancy Poultry, Pet Stock and Ferrets.

**FAIRVIEW STOCK FARM.** Breeder of Short Horn Cattle, Mammoth Bronze Turkeys and B. P. Rock Chickens. Young Stock for Sale.  
F. R. HAMMOND, Prop., Bismarck, N. D.

**FOR SALE** Six farms, joining, 6 miles from Bowbells, will be cheap. Write for particulars. The Lyon Land and Loan Co., Bowbells, N. D.



## FROM THE NATION'S CAPITOL

By GUY E. MITCHELL

### NEW PLAN FOR NATIONAL ROADS

Government co-operation with the states in road building is the plan of a bill introduced in the House of Representatives by Representative Grant of North Carolina. He wants Congress to appropriate \$25,000,000, which is to be used in the states which put up equal amounts. In the bill which has been introduced in the House, Congressman Grant provides that the Government's share be disbursed by a body of three road commissioners under a bureau of roads, which his bill also creates. The commissioners are to receive \$4,000 a year.

Not all of the \$25,000,000 is to become available at once. Only one-fifth of the sum is to be used the first year and one-fifth more each year thereafter until the whole sum is expended. If the scheme works, and the states and counties respond, a total of \$50,000,000 will be expended in five years for road improvement in the United States.

During the past few years new ideas as to Government co-operation and encouragement of public highway building have been advanced in Congress. Not long ago Senator Bankhead of Alabama proposed a scheme similar to that of Congressman Grant. It was the Alabaman's idea, tho, to justify his road policy upon the ground that better roads would facilitate the rural free mail delivery.

It is claimed by many that Congressman Brownlow of Tennessee is the original Federal good roads advocate. He demanded that \$50,000,000 be expended outright for roads and he brought to the support of his bill the combined automobile associations of the country. With the adoption of a policy of strict economy, Congress, so far, has done nothing in the way of building highways in the states.

### FOOD PURIFICATION A STEADY GRIND

While one may not hear of spectacular cases of seizures of impure foods or startling law suits in the courts, nevertheless the Department of Agriculture is very active in enforcing the pure food law, as is evidenced by the almost daily bulletins from Secretary Wilson's office of judgments obtained against this or that manufacturer.

Examples of seizures such as are occurring daily are given in a recent list of notices of judgment issued by the Department. A shipment of 42 barrels of alleged apple cider vinegar was found not to be pure cider vinegar at all, but to be adulterated and artificially colored.

A certain kind of table twas found to contain a dangerous drug, acetanilid, without the label showing the quantity of the drug or the proportion. A quantity of coffee was found deceptively branded. Lemon flavor advertised as harmless was found to be adulterated and misbranded and to contain a "poisonous ingredient."

Alleged cancer cure tablets were condemned as misbranded and liable to seizure under the law. A quantity of cream was found adulterated. A substance purporting to be honey was found to be chiefly glucose and starch sugar, and there were other violations of the law which had been brought to the attention of the courts and condemned.

### RAILROAD DEMONSTRATION FARMS

It is announced that the New York Central and Hudson River Railroad has completed plans for the purchase and operation of three large farms in different sections of New York as a demonstration of what can be accomplished for the rejuvenation of "run down" farm properties by the application of modern scientific and business methods. These enterprises are to be managed strictly for profit, but it is intended to use no methods that are not equally available to neighboring farmers.

The Delaware, Lackawanna and Western Railroad is contemplating the purchase of one or more farms along its line, with a view to turning them over to the agricultural colleges or other agricultural institutions for maintenance as demonstration farms.

Announcement has also been made that the Great Northern Railway will institute a series of cooperative farm experiments in conjunction with various development and commercial clubs in the towns along its line. One farmer is to be selected near each town who will be paid at the rate of \$10 per acre annually, in addition to his crop, for cultivating

and cropping not less than 6 acres of ground under directions to be supplied.

### FERTILIZER MANUFACTURERS ALARMED

"Fertilizer manufacturers in this country will be greatly handicapped by the proposed action of the German government in placing an export tax on certain necessary fertilizer materials," said Mr. Charles Diedrich of Chicago, who was in Washington this week. "Manufacturers in this country are going to appeal to the government, and make a united protest against Germany placing the tax on the ingredients. A movement, also, has been started among the manufacturers to ask the government to adopt retaliatory measures against Germany if she persists in placing the tax on the exports. If the reichstag passes the export tax bill they will ask the government to place tariffs on other German products and thereby force Germany to abandon the tax. The manufacturers recently met in Atlanta, Georgia, and adopted resolutions to this effect."

### EVOLUTION OF MACHINERY

The invention of the reaper, which has revolutionized farming, was not the result of a flash inspiration; it was the direct outgrowth of the struggle of four generations to practically the same end, and came as a climax to hundreds of failures. Some writer, the other day, called attention to the fact that the success of the Wright brothers in building aeroplanes came as a climax to something like a thousand years of investigation. In other words, man aspired to fly long before he learned anything about surface transportation. When we come right down to the point of it, says the Black Diamond, the present day automobile was long ago in contemplation, and the steam railroads were the compromise. Thus, we are forced to the conclusion that every invention of benefit to mankind has been the evolution of some crude idea.

## Fargo Seed House

Growers, Jobbers, Shippers

We pay a premium for bright, fancy field and grass seeds, also seed grain. Send us samples for our bid F. O. B. your station.

FARGO SEED HOUSE, Fargo, N. D.

See Ad Offer, Page 2--A Winner



# THE STATE FAIR

## ATTRACTIONS GALORE

### DON'T MISS IT

DESPITE DRY YEAR THERE WILL BE SPLENDID EXHIBITS OF FARM PRODUCTS, STOCK, ETC.—SOMETHING OF THE MANY SPLENDID ATTRACTIONS.

President Smith and Secretary Finrock are delighted at the prospects for the big North Dakota state fair which will take place in this city the week of July 25. Everything is ready and the details are all completed for giving the biggest and best exhibition that North Dakota has ever known.

If one were to ask what is to be the biggest free attraction at the fair outside of the fastest pacers in the world, the officials would doubtless say that the ten acting snow white stallions are the greatest act. This troop of educated horses was one of the features of the state fair at Syracuse, N. Y., as it was also at the Minnesota state fair last year, and the managers of the Fargo state fair are more than pleased to be able to announce the appearance of the company in this city. These beautiful creatures do almost everything but talk. They march with military precision, forming in pairs, fours and platoons, and as they come towards the grandstand on their hind feet they present an appearance that will never be forgotten.

Immediately in front of the grandstand has been erected a forty-foot stadium on which will be seen many free exhibitions between the races and at night. The six or eight acts that have been selected by the fair management are of the highest class and in keeping with the balance of the big show. The Patterson shows or carnival company will also give several free acts, some of them so thrilling that they alone are worth the price of admission. The number of concessions let this year is about the same as in previous years, so that the sound of the barker will be heard just as often and as loudly as heretofore.

The four great pacing horses, the fastest in the world, will give an exhibition that will be well worth the price of admission. Their exhibitor is going to do his utmost to break some world's records during the stay of the animals in this city.

#### THE BATTLESHIP NORTH DAKOTA

One of the most interesting exhibits that will be on the grounds will be the twelve-foot model of the celebrated battleship North Dakota. It was obtained thru the efforts of Congressman Hanna from the United States government. The fair people were obliged to give a bond in the sum of \$5,000 to insure the safe return of the model to the government.

Every gun is in place, every rope appears, just as they do on the great ship for which this state was named, and it doubtless will be one of the attractions that will be most popular. Just where this will be placed is not yet known, but it will be given a conspicuous position in one of the big buildings.

#### THE FARM EXHIBITS

The exhibition of farm products naturally is the greatest thing at a fair in North Dakota, and despite the dry year the 1910 fair will be a leader in this respect. The entries of fancy stock are the best that have ever been made at a fair in this state, and besides being interesting will be of great educational value.

There is every reason for believing that the work of the ladies will be much in evidence this year, for the premiums are even more liberal than on previous years.

The purses for the races, too, are most liberal, and it is believed that the finest races ever seen on any fair grounds in North Dakota will take place here during the 1910 state fair.

There will be ample accommodations for those who desire to take their meals on the grounds, for the big new dining room is almost ready for occupancy. There will be three bands to furnish the music during the six days of the fair. The Patterson shows have two bands also. The Patterson shows are said to be the greatest aggregation of attractions ever shown on any fair grounds. There are eighteen shows in all, under the management.

# July 25-30 Inclusive

# FARGO, N. DAK.



## Poultry Department

Prof. O. W. Dynes, Agricultural College

Mrs. B. F. Wilcoxon, Hildale, Wyoming

There are plenty of grasshoppers this month but don't think that the chickens can live on them alone. Give them all the feed that you can get them to eat, with the grasshoppers as an extra.

Keep the house as cool as possible. The shady nooks are relished by the hens. Keep right on fighting the army of lice and mites. They like to hide away under the end of the roosts. Every time you spray, lift the roosts and give the pests a dose that will drive them out for good and all.

Now that the weather is so warm be careful in gathering the eggs. Don't let any suspicious ones get mixed in. One bad egg is enough to put a question mark on the whole week's production and may lose a customer.

Be sure that the duckings have plenty of shade and water. They will eat more in the morning and at night than thru the middle of the day. Don't keep the goslings in the hot sun. They want plenty of shade, fresh water and grass.

Do not hold cockerels intended for market too long after they reach the weight of four or five pounds. The price per pound generally goes down, and you are feeding away your profits. It is so easy to do this. It is up to you to get your money out of them at the earliest opportunity.

July is termed a late month for hatching, but if you have not ample stock by all means get out enough to "make good." If these chickens are given as good care as those hatched earlier they will mature in January and February and make the best of summer and late fall layers, and often times they are as profitable as the earlier ones. Try it once and see.

I know of no crop that will produce such returns in green feed for poultry as Dwarf Essex Rape. You can sow at any season of the year wet or dry, hot or cold. Frost does not hurt it. It makes a good growth anywhere. The plants soon rival cabbage in size and make the best of feed.

See that the growing stock has plenty

of room to expand. Be sure that every chick has plenty of room to grow in and see that they are not overheated at night. July and August are bad months for crowded quarters. The seeds of next winter's crop of roup are sown in this month. By keeping the youngsters crowded into quarters about the right size for one-fourth the number the chicks get too hot at night and take cold during the chilly mornings of September.

Is it anybody's fault if the little summer chicks are dying. Have you looked for lice and mites. Have they shade and cool water to drink? The tender little fellows cannot withstand heat and lice combined. Protect them from the sun and get after the lice.

July and August are good money making months. Prices of poultry are at good paying figures. Eggs bring good prices and chicks hatched this month make good fries in February and March. These chicks grow like weeds; give them the run of the corn fields and see them grow.

I don't tell you that \$5 to \$10 can be cleared on every hen kept and in the back yard; and that you only need a few fowls to make you independently rich. But I know that there is no industry that will begin to pay the profit for the time and trouble expended as can be had from poultry.

Any business to succeed must be well balanced. The capital should give the labor end of the business all it can do. You should have birds enough to care for to fully take up the time. It is up to each one of us whether we need more laying stock to help swell the profits. The chances are that you could care for double the amount of stock with little or no more labor expense.

The poultryman's profit depends upon plenty of room for the chicks and growing stock at all seasons. Most failures can be traced to crowded quarters. Birds that are crowded night or day, kept in hot coops will soon disappear with colds and roup.

The profits are in the all-the-year-laying. It is the early laying pullets, kept steadily laying thruout the year that pay the handsome profits. A net profit

of from \$2 to \$3 per pullet from eggs alone, is "handsome profits." Get the hens started right and keep them at the laying business. So many people expect their hens to stop laying soon after summer comes and sell their hens to cut down the feed bill. Why do your hens stop laying?

The loss of income to presence of lice on fowls, while probably not as large as that due to the common mite, is yet enormous. Fowls which are infested with lice cannot produce as many eggs nor as many pounds of flesh as can those that are free from these vermin. Lice are especially harmful to young chickens. I think that the worst external parasites of poultry against which the poultry raisers had to contend is the "common chicken mite." This blood-thirsty pest causes great loss to the poultry industry of the country by killing adult fowls and chicks and cutting down egg production. Unlike the louse the mite doesn't live on the birds at all times, except in extreme cases of investigation, but lives and breeds in cracks, crevices and corners of the roosts building, nests and elsewhere about the poultry house. It generally attacks the fowl when on the roost or nest. In some cases it is actually possible to gather them up by the spoonful. The best way to get the lice off your poultry is not to let them get on. There is no more exasperating experience than can be gained in trying to get the nasty little red mites and spider-lice out of the poultry house. They have a hold on life altogether out of proportion to their size and are blood-sucking, life-sapping, rapidly multiplying little pests. If there is anything which a good poultryman detests any more than these atoms of poultry destruction, I do not know what it can be. Any one who has ever been in contact with them will agree with me that the best way to get rid of them is to prevent their coming in the first place. Once lice and mites gain a hold they stick hard and many a poultryman has been driven out of the business by these same thirsty little blood-suckers. They sap the life of the chickens, they are instrumental in making and spreading disease and rob the purse of the owner. So far I know they have no good qualities—they are altogether bad.

All hens that show evidence of poor condition should be examined for lice. Some poultry raisers have rid their fowls of lice by dipping the birds in a diluted stock dip. Dipping should be done in the morning of a bright warm sunshiny day in order that the fowls may become dry before night. Liquid lice killers are used to spray the roosts and dropping boards. Their fumes rising thru the feathers of the birds cause the lice to



drop off. During hot weather the hen-house should be sprayed often to keep down the lice and mites.

### THE COMET TO BLAME

A recent dispatch from Cairo, West-Virginia, states that Mrs. Viola Marshall, of that town, has a rooster among her flocks which lays an egg regularly every day. She bought this rooster, it is stated, under the impression that it was a hen, but soon discovered a handsome comb and wattles, and spurs an inch and a half in length, and this rooster egg layer which can crow just like any good respectable chanticleer should crow, is a perfectly formed rooster. The censor for the Nature Fakir's Club is very busy and so judgment must be suspended.

### BACILLARY WHITE DIARRHEA

Guy Mitchell

When poultrymen lose from 60 to 75 per cent of all chicks hatched thru what is known as white diarrhea, it is certainly fit for the scientists of the country connected with the Department of Agriculture and the various state experiment stations to spend considerable attention toward finding the cause and prevention of the malady. The term "white diarrhea" has, unfortunately, been used in connection with several distinct kinds of bowel trouble in which the intestinal discharges are of a more or less whitish character, but the true bacillary white diarrhea is where the white discharge from the vent has a more or less sticky or glairy character and of sufficient quantity as to seal up the vent, or what many poultrymen designate as "pasteing up behind." The chicks soon become listless and sleepy, inclined to huddle together and remain under the hover much of the time. The wings droop or project slightly from the body, with feathers ruffled.

The Storrs Agricultural Experiment Station has been studying this disease for more than ten years and while early developments seem to show the disease to be caused by a particular organism, recent experiments have proved the first suspicions, i. e., that the true white diarrhea is caused by bacteria known as *Bacterium pullorum*.

In one experiment a lot of eggs were secured from a leading poultrymen of the state of Connecticut, whose poultry were kept on free range, the varieties being White Leghorn and White Plymouth Rocks. The eggs were placed in incubators of different makes and the hatches were satisfactory in every respect. From this hatch 396 chicks were selected, divided into six lots of 66 chicks, and placed in outdoor brooders. Three of the lots were infected with bouillon cultures of *Bacterium pullorum*. When about 24 hours old each chick was

given a few drops of the bouillon culture. The material was also used in the drinking water and to dampen two feeds per day for ten days. The three control lots were kept under identical conditions. In these lots growth was satisfactory from the start, with comparatively low mortality. A few died from a disorder diagnosed as bacillary white diarrhea, which probably was the result of infection from the hen. The disease made little headway.

In the infected lots all the symptoms of bacillary white diarrhea were soon observed. The chicks had poor appetites as compared with those in the check lots and the mortality was high. During the first month the loss was as follows:

Control lots, 16 chicks, or 8%  
Infected lots, 57 chicks, or 29%

At one month of age the surviving chicks were weighed, and the controls were found to be 17% heavier than the infected lots. At eight weeks of age the comparative loss was as follows:

Control lots, 33 chicks or 17%  
Infected lots, 94 chicks or 47%

From the investigations thus far made at the Storrs Station, it has been determined that the mother hen is the original source of infection of the chick. A certain percentage of the chicks on infected farms have the disease when hatched, while a great number contract it by exposure during the first three or four days after hatching. This has caused the station to recommend that the chicks be segregated in small lots for the first week, since it has been shown that the disease can not, apparently, be transmitted thru the food supply after the chicks have reached the age of three or four days. It is recommended that brooders or brood coops be thoroughly disinfected; that the litter (alfalfa meal preferred) be changed frequently; food and water supply supplied in such a manner as to prevent contamination, and above all that the poultryman raise and maintain the vigor and vitality of the breeding stock and chicks by every reasonable means known.

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MRS. B. F. WILCOXON,  
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Choice Stock and Fair Treatment.

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**White Crested Black Polish** Chickens, Eggs \$3.50 for 15, Chicks \$7.50 a pair.

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Silver Wyandotte Eggs, from Fargo 1, 2 Ribbon birds, \$3.00 per 13. From 300 hen flock, \$3.50 per 100 eggs. Baby chicks from flock, 10 cents each.

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10 Months For Only 10 Cents

**GRAND 5-YEAR OFFER, PAGE 20**



## School and Home

### THO LIFE WERE ALL

Tho life were all,  
And its cessation silence, night, the  
grave;  
Yet from our lips no note of fear should  
fall;  
Dear Heart, be brave!

Tho this dim hallway down which mortals go  
Lead into night,  
Wide all its windows to the Sunshine  
throw—  
Live in the Light!

Tho thru the star-flecked spaces ne'er  
should flit  
This thing that men call Soul;  
Tho birth and death and daily bonds en-  
compass it,  
Life still were whole.

Still flowers bloom, the winds go sing-  
ing by  
The songs that Eden heard;  
Deep unto deep of longing makes reply,  
Still Soul by Soul is stirred.

All that man longs for potent in life is  
Joy, labor, love, content—  
Tho else were silent all eternities,  
With these, thy Soul well spent!

Just for today, Dear Heart, live large of  
Soul;  
Just for today, walk where the Light  
streams fall;  
For so to live, were recompense and  
goal,  
Tho life were all!

—Hugh J. Hughes in October Century.

### LIGNITE A VALUABLE FUEL

By H. Batchelor, Fargo, N. D.

Lignite coal when properly treated at the mine before shipment contains as much available material for combustion as the average coal.

North Dakota lignite is very low in its percentage of ash and sulfur, thus making it superior to most eastern coals in these respects. Comparisons made between the lignite found in this state and

the coal found in Pennsylvania have not been made on a fair basis.

Anthracite coal when taken from the mine contains a heavy percentage of slate, which is picked out by boys in what is known as the breakers, or the building where the hard coal is dumped when taken from the mine and broken into sizes suitable for use.

Bituminous coal is screened and washed before being marketed, and such foreign matter as slate when found is picked out by hand.

North Dakota lignite when taken from the mine contains from 25% to 40% of water, it is shipped in that condition. Naturally when the consumer gets it, it does not burn well. No one ever attempts to burn green wood and keep warm in the winter weather, neither do they attempt to cook with it and expect to get a meal the same day.

Why should any one expect to burn lignite as it comes from the mine and get satisfactory results? Any one who has ever tried to use green wood knows that it is not a success as a fuel. Then why should any one expect to make a success of trying to burn green coal?

Every time comparison is made between the coal found in this state it is done under unjust conditions, that is to say, green lignite containing 40% moisture, is placed against, hard coal which has been broken into suitable sizes and hand picked, of course the comparison is most unfavorable, it could not be otherwise.

North Dakota lignite was given a thoro test by the United States Geological Survey at St. Louis and the results of those tests can be found in Bulletin No. 325. On page 160 is a chart showing the heating value of coal. North Dakota lignite stands third in the tests as compared with other coals. A statement accompanying the chart contains the following, viz: "The main object of the chart is to show that some Illinois coals are capable of use in high-temperature work, as in making malleable-iron castings. In fact by preheating the air used that is for combustion, Illinois coals are now burned in reverberatory furnaces in Chicago and St. Louis. The curve shows that lignites could be

used with preheating, especially as some lignites are low in sulfur and burn freely with a long hot flame."

The lignite referred to is from North Dakota and it makes as good a showing as Illinois coal.

The extended use of lignite as a fuel will be solved by using modern methods of treatment at the mine, whereby all of the moisture will be removed. When burned in properly constructed furnaces or stoves it will give as much heat as any coal now in general use. It is more than doubtful whether briquetting will solve the problem owing to its cost of production. But this is not necessary, even if it were not expensive, as nature has been making efforts to show man how to use it to the best advantage and there are those who claim that its use will eventually become general thru using it in the form of dust.

The children in the public schools should be taught the facts concerning lignite, as it is the greatest natural resource of the state, but they are not.

The Commercial Geography used in the Fargo high school is written by Cyrus C. Adams, a traveled and cultured man, but he is not a chemist, neither is he a fuel expert. In the work written by him and now used in the high school is found, on page 117, the following statement, viz: "And lignite which is least valuable as fuel." Whose word shall we take in this matter? That of the United States Geological Survey, backed up as it is by the nation, or that of a man who is not a chemist? He is neither a fuel expert, nor has he made exhaustive tests of the lignite found in this state?

The state has appropriated \$30,000 to be expended annually in advertising the vast natural resources found here. This work is being ably conducted under the management of W. C. Gilbreath the Commissioner of Agriculture and Labor. Does it not look like folly to spend \$30,000 every year to tell the country what we have in this state, and at the same time allow books to be used in our public schools which teach that our greatest resource has little value?

The objectionable features of the book in question should be eliminated therefrom, or the book stricken from the curriculum of the schools.

### AMERICAN COUNTRY WAYS

By Edward W. Perry in The  
National Grange

American country ways can scarcely be called ways of pleasantness. On the contrary, they are usually crude and dirty, rough and noisy. They waste time, patience and energy, and they spoil the comfort of all who must endure these defects. In dry seasons they are

**Live Agents Wanted for North Dakota Farmer**



dusty, in wet weather they are little better than canals of mud; and at all times they are needlessly steep and costly.

This is true largely because American highways, like Topsy, "jest grewed." Practically all our roads began as mere trails thru wilds, were widened a little by the pioneer who lopped off a branch here, a root there and cut down a tree yonder, that his pack-animal might squeeze past. Later comers dug up a stump or a stone, now and then, and trimmed down the sharp banks of the stream, because they were using cart or wagon to carry wife and babe and household belongings to their new home in the wilderness.

All these early travelers followed the

But millions who dwell in country places now see that their wagon roads should be made far better than they have ever been, even when at their best. It has at last been seen that the condition of these roads affects the pocket-book of every human being in all the land, more directly and materially than it is affected by any other one cause. This will be so while every human being in the land must use products of the American farm, because all these products must be hauled over these thoroughfares from farm to market. The cost of such moving is increased by everything that hinders the easy moving of the wheels by which the products are carried.

More than half of the scores of millions

whole, before the Office of Public Roads, a bureau of the Agricultural Department at Washington, gave us, last year, the nearest approach ever made to the precise truth about the condition and the cost of our public highways. This is the more notable because at the end of each of many decades our national government has given us tomes of copious and most minute information about the number, birth and color, the work, wages and wealth of our people; about the size, products and value of our farms; but never before last year had any administration even an approach to fair support for its efforts to give to the nation accurate data covering the miles and the character, the annual cost and the existing condition of its country roads, which are as the arteries and the veins thru which must flow that commerce which is as the very life blood of our prosperity.

We have been told by authorities that the American farmer loads an average of a little more than 2,000 pounds on his wagon and draws it 12 miles, at a cost of \$3. This equals 25 cents a ton mile. If we assume that the wagon-load is an even 2,000 pounds and that the cost of hauling will be \$2 instead of \$3; and if we assume that the 9,404,430 persons in agriculture in this country use half of the products of our farms, and that the other 66,568,350 persons use only the other half of these products, the cost of taking these to market would be \$196,153,000.

Many tests have shown that loads may be drawn in wagons over macadam in average condition at a cost only a little more than one-third that of moving like loads over earth roads in ordinary condition. If this is correct, a saving of \$130,768,680 might be made in the cost of marketing half our crops of a year, if they could be hauled over macadam rather than over common earth roads. That saving would equal \$1.72 apiece for us, or much more than all our roadwork for the year costs.

But macadam roads cost much money. Still, it may be that the first cost will concern the American people less than will the question: What will the investment in good roads actually pay us? Of course everybody knows that this nation can get, at moderate rates of interest, all the money it will spend on improvements which will pay interest and sinking fund, if the financing were done honestly.

A saving of \$130,768,680 per annum would be enough to pay 4 per cent interest and 2 per cent sinking fund on \$2,179,478,000. That would be enough to build 243,000 miles of good macadam, and in 9 years such amount could macadamize every mile of road in the land.



Live Weight

line of least resistance, so far as they found it without too much searching. Believing that they would not soon go that way again, and used to making light of such difficulties, our sturdy fathers did little more than was necessary to the moment. So many followed that in a few years they found it good to come together, now and then, to make roads, as neighbors in those friendly days used to have logging-bees, house raisings, apple-paring parties, and quilting-bees, and such other meetings for mutual help as might fairly be made an excuse for dance and frolic. To this hour, in many a corner of the land, road making is regarded as a yearly "bee" at which neighbor and friend should swap tobacco and yarns and jests between short spells of work.

of tons of things taken each year from American farms; practically all of the tens of millions of tons of food required by seventy millions of people of this country; all the millions of tons of cotton and of wool they wear, and many another thousand tons of other things they want for their health, their comfort or their luxury, must be hauled by animals thru dust or sand or mud, up steep grades or over pebbles that make up the first stage of their journey from field to consumer. From this wastefulness no present relief is offered, because almost ninety-three of every hundred miles of American wagon roads are rough and steep, badly drained and costly.

These truths about our highways were scarcely known to the people as a



This is a peaceful nation, but in the decade ending 1906 it spent for war purposes \$2,021,390,306, or forty-three times as much as was allotted to agriculture. Yet our farms have for generations been our most effective defense against aggressions by other nations. No power dare so war on us as to check the flow of the mighty river of life that flows from America to feed the Old World. Europe could not permit such stoppage, and live. A mere threat to do so would ensure peace.

Do not justice to the farmer, consideration for the welfare of all consumers, and plain commonsense demand that this nation shall spend, to make its wagon roads good, at least as much money each year as it shall spend on its waterways? The wagon roads may be kept always open for free use by all the people; the waterways may be monopolized easily for the great transportation interests.

#### ONE MORE WORD ON DURUM FLOUR

By Charles Christadora, San Diego, Calif.  
in "Bakers Weekly"

Wheat, as a term not applied to any kind of wheat—winter, spring, hard, soft, etc.—is about as specific as "durum," when not applied to Kubanka, Velvet-Don, Black-Don, Gharnovka, and actually one hundred more varieties of durum wheat grown in the world.

The fact that durum flour is a new proposition, makes it as ridiculous for one to condemn it on an off-hand trial, as it would be for a baker to condemn some hard wheat flour that was new to him, he having used nothing else all his life but soft flours.

Secretary Wilson, yielding to the cry of the farmers to find them any kind of a crop they could grow on their semi-arid lands, rolled up his sleeves and went to work and fairly scoured Europe's agricultural area, and brought home durum wheat, and if one can judge from the milling journals he deserved being hanged, drawn and quartered for the act of introducing another new wheat.

Well, the farmers took the seed that the Secretary of Agriculture distributed amongst them and went ahead. They have had a devil of a time, just as the Minnesota Spring and the Turkey Red farmers did, but they kept at it. The durum seed that cost \$10,000 ten years ago has yielded to date \$200,000,000 in crops of durum wheat. And yet the American baker and the American housewife as yet are about as unacquainted with it as with an inhabitant of the moon.

Yet Miss Marlatt says, and we must give her credit for knowing whereof she speaks, that durum flour is the biggest

yielder and best bread-maker, or words to that effect.

Where has the \$200,000,000 worth of durum wheat gone? And statistics show that it was grown. That's the question. The exporters took some for Italian macaroni and French bread. The makers of macaroni in America took some, and the balance, well, we can all of us keep up a devil of a thinking, but we don't know. There are some mills who have consistently kept strictly to the milling of Minnesota Spring wheat and never have blended a bushel of durum. Prejudice, I say, because Kubanka Durum will lead and does lead Minnesota Spring in gluten, sugar, flavor, etc., not to say anything about the yield. Mr. Schinkel, one of the most experienced and reliable members of the baking fraternity, says, compared with Minnesota Spring wheat flour, durum yields 16 lb. more dough to the barrel and has other superior points. If we couple the fact that durum has, as a rule, sold 20 to 30 cents per bushel less than No. 1 northern wheat in the market, with the experience of Mr. Schinkel, I can't see where any harm was done by the millers "adulterating" soft or any other kinds of wheat with a generous blend of durum, from 10 to 50 per cent. The baker and the public certainly did not suffer by the "adulteration," and if the miller gained a little by it, who can blame him? If by the use of durum he made his otherwise weak flour hold up and give satisfaction all around, where was any harm done?

Of course, when you realize the above and then listen to the universal cussing that durum gets from miller and baker, it is to laugh moderately and quietly in your sleeve.

But there is much to learn about durum on the farmer's part. It won't do well on soil that is well watered and where soft wheats are grown under ideal conditions. It needs but little rain, and a fierce sun heat during its ripening period, and it is capable of living thru a drouth that would burn up any other wheat. The farmer has narrowed down the 100 and odd kinds of durum to about half a dozen kinds, and the government stations are educating the farmers that in certain sections Kubanka is the proper wheat to grow; Black Don at some other section; and Arnautka again in some other section of the country, etc., these being ideal durum bread wheats.

The farmers once educated up to this, it means a stable, higher grade of durum coming into the market and the days of farm experimentation over with as to durum.

The miller, who cursed the very name of durum, has tempered his rolls, got wise to tempering the wheat also, and what's the result? Durum is being grown today with as much ease and with as satisfactory results as any wheat

grown. The great problem of grinding durum has been solved. Minnesota Spring and Turkey Red years ago turned the hair of the head miller grey, because of their hardness, but a way was found. Then durum, hardest and most glutinous of all the wheats, came along and simply made some of the millers who tackled the problem of grinding (as they called it, "pigs' knuckles"), more than disgusted. A few grains of durum going thru their rolls with soft wheat made the sparks fly. But no real first-class up-to-date head miller will go on record today as saying that durum cannot be ground into a patent, because it is being done day in and day out, and whether sold as durum or blended, it has been made into A1 flour.

Durum flour is not only the richest flour in natural sugar, sucrose, but it is the richest of all the flours in gluten, and that explains Miss Marlatt's statement that durum flour gives the biggest yield. It is this presence of gluten that enabled Mr. Schinkel to get 16 lbs. more dough from a barrel of durum than from Minnesota Spring.

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And hence, being rich in gluten and being golden colored, necessarily durum flour is the creamiest flour in the market today, and some of the most rabid durum-phobes have finally condensed their objections to durum down to the fact that it is a creamy flour, and instead of making a chalky loaf it makes a creamy-looking one.

Its abundant yield to the farmer irrespective of drouth, its adaptability to growth on millions of acres of semi-arid desert lands, impossible of irrigation, a fact that will ultimately turn the semi-arid great American desert into one vast wheat field (that part of it above irrigation), all the above is conceded universally. ¶

The fact that from standard grades of durum wheat as much, if not more, patent flour can be milled than from ordinary wheats, and that, with proper machinery and tempering, durum wheat presents no problems to the skilled miller, is being gradually conceded as the days go on.

The fact that durum flour is the richest in gluten, in natural sugar (saving the need for added sugar), is of fine flavor and produces a rich "bloscy" crust, is yet for the bakers to learn.

In 1950 we are to have 200,000,000 people in this country, and we must feed them, and already we are hearing of the impending importation of wheat from Europe and South America to supply our present needs. Yet we have millions of acres of unused land in the great Southwest, heretofore considered too poor to "bury a dead Indian," that, under intelligent farming and moisture-conserving methods (called "dry-farming," because above the influence of the irrigating ditch and being rain-dependent only), will grow durum wheat to perfection, and enough of it not only to feed our prospective 200,000,000 inhabitants, but some outsiders as well, keeping us an exporting wheat country for all time.

And all the above is gospel, if what Miss Marlatt states is so, that "Durham flour gives the biggest yield, the best bread and is the most profitable flour for the baker to use."

#### FLY-KILLING TIME

Awake ye housekeepers! Thy enemy is at hand ready to take his tribute. In short this is fly-killing time. Every householder should by now understand that the fly is an enemy. It is the herald and advance agent of disease, a distributor of filth and bacilli, a carrier of typhoid and tuberculosis and practically all the other ills from which humanity suffers. The whole secret of the danger of the common housefly is hidden in the phrase, "Remember a fly does not wipe its feet."

Once upon a time flies were regarded

as a necessary nuisance. They were known to be scavengers, and they were tolerated because it was felt that they were helpful to mankind by cleaning up the foul places. A more mistaken notion never prevailed. Instead of being destroyers of filth they spread it. No place filthy enough to need flies as scavengers would be likely to recognize the danger of a transference of the unwholesome elements from one place to another.

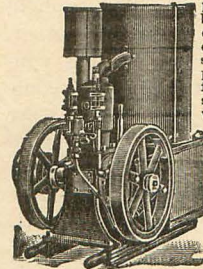
Recent researches have convicted the fly on the most unmistakable evidence. It is the plainest of present propositions that an unscreened fly-ridden house is in danger of disease invasion. Bacteriology presents the proof so clear that the least scientific mind can grasp it. "The house fly does not wipe its feet."

The problem is explained thusly: "There is a patient suffering from ty-

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perfectly. Runs on gasoline, too, better than any other. Basic patent. Only 8 moving parts. Comes complete ready to run. We will send a "Detroit" on free trial to prove all claims. Runs all kinds of farm machinery, pumps, saw rigs, separators, churns, feed grinders, washing machines, Silo fillers and electric lights. Money back and freight paid both ways if it does not meet every claim that we have made for it. Don't buy till you get our free catalog. 2 to 24 h.p. in stock. Prices "stripped," \$29.50 up. Special demonstrator agency prices on first outfit sold in each community. 2,000 satisfied users. We have a stack of testimonials. Write quick. (52)

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phoid. Enters Mr. Fly who may alight on a piece of soiled linen, etc., bearing thousands of typhoid germs. He makes his exit and flies away to another home where the family is sitting around the dinner table. Mr. Fly does not wipe his feet and alights on the butter or maybe the dinner plate, or may get drowned in baby's milk. The typhoid germs are spread in this simple manner.

Babies are dying because flies contaminate their milk. Grown people are sickening because flies bring disease germs from unknown sources and spread them upon foods, on bread, on sugar, on meats, upon everything the trespassers can reach with their germ-laden feet.

Flies can not be exterminated. That is impossible. It calls for a systematic screening and sterilization of all possible breeding places, such as manure pits and garbage cans, the cleaning out of refuse, the burning of trash; the effective covering of manure pits, the greatest home of all for flies. In this crusade everybody must work together.

#### HOW YAMS ORIGINATED

It is the belief of the Metuans of New Guinea that yams first grew from bones. This is how it happened. A Metuan girl who had five brothers married a cannibal who lived some distance away. The brothers came by turns to visit her and four of them were eaten by the cannibal husband. The wife, however, kept their bones, and when the fifth brother came, instead of being eaten like the others, he succeeded in killing the cannibal husband and returned to his home with the bones of his brothers. The bones were duly mourned over and buried. When the relatives visited the place where the bones were buried some time later they found a strange plant growing upon the grave, and on digging up the bones found they had turned into yams of different colors and sizes.

It is said that the Department of Justice has cast the die that will tan the leather trust.

#### THE AUTOMOBILE IN THE COUNTRY

Charles B. Hayward, in Harper's Weekly

Legally, there is a speed limit of twenty miles an hour in the country districts; but actually there is no limit with the motor-car, once the driver gets away from the cross-roads so dear to the heart of the country constable, ever on the alert for his emolument. In the open country there are no restrictions upon speed except those that the automobilist places upon himself. The average driver has very little realization of the many risks involved in traveling over unknown roads at a speed that

would be frowned upon in more settled districts, altho perfectly safe where the road ahead is visible for a considerable distance. Nothing is quite so disconcerting to the driver of a horse vehicle on a narrow byway as to have an automobile loom up suddenly around a corner at a speed that makes disaster seem inevitable. If there be any habit of the motorist that tends to keep alive the prejudice and hate of the rural dweller against his kind it is this.

The only corrective for the driver who looks upon might as right and considers his position supreme, regarding the su-

perior power and speed of his vehicle as ample license to drive as the whim seizes him, is the inevitable accident that sooner or later overtakes him. The considerate driver, who would not intentionally infringe upon the rights of the humblest user of the road with his sorry "hay motor," needs only to have his attention called to the conditions of back-road travel to avoid even the appearance of recklessness. But the man who is neither reckless nor considerate of others has many things to learn about the dangers to be encountered when venturing off the main thoroughfares.

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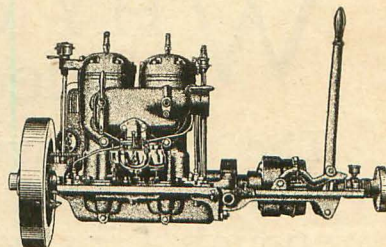
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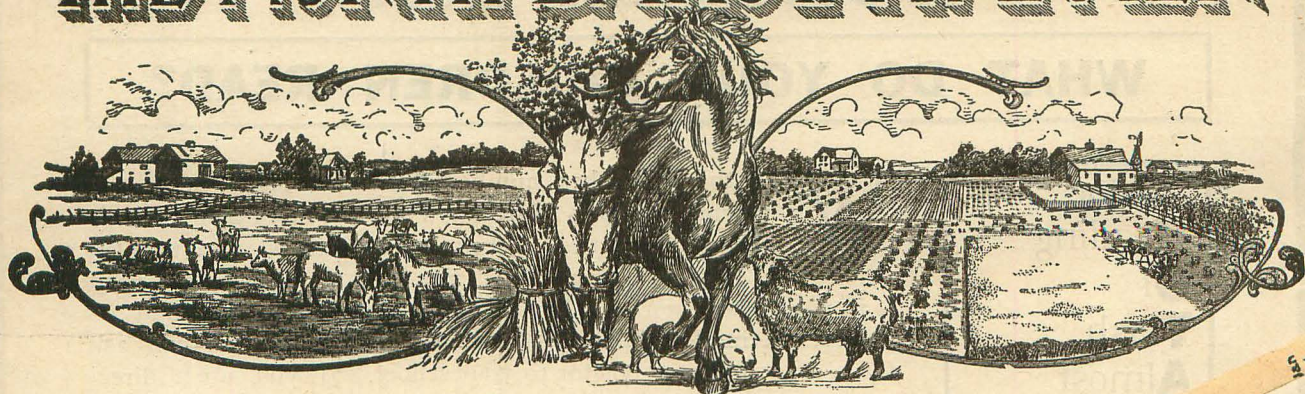
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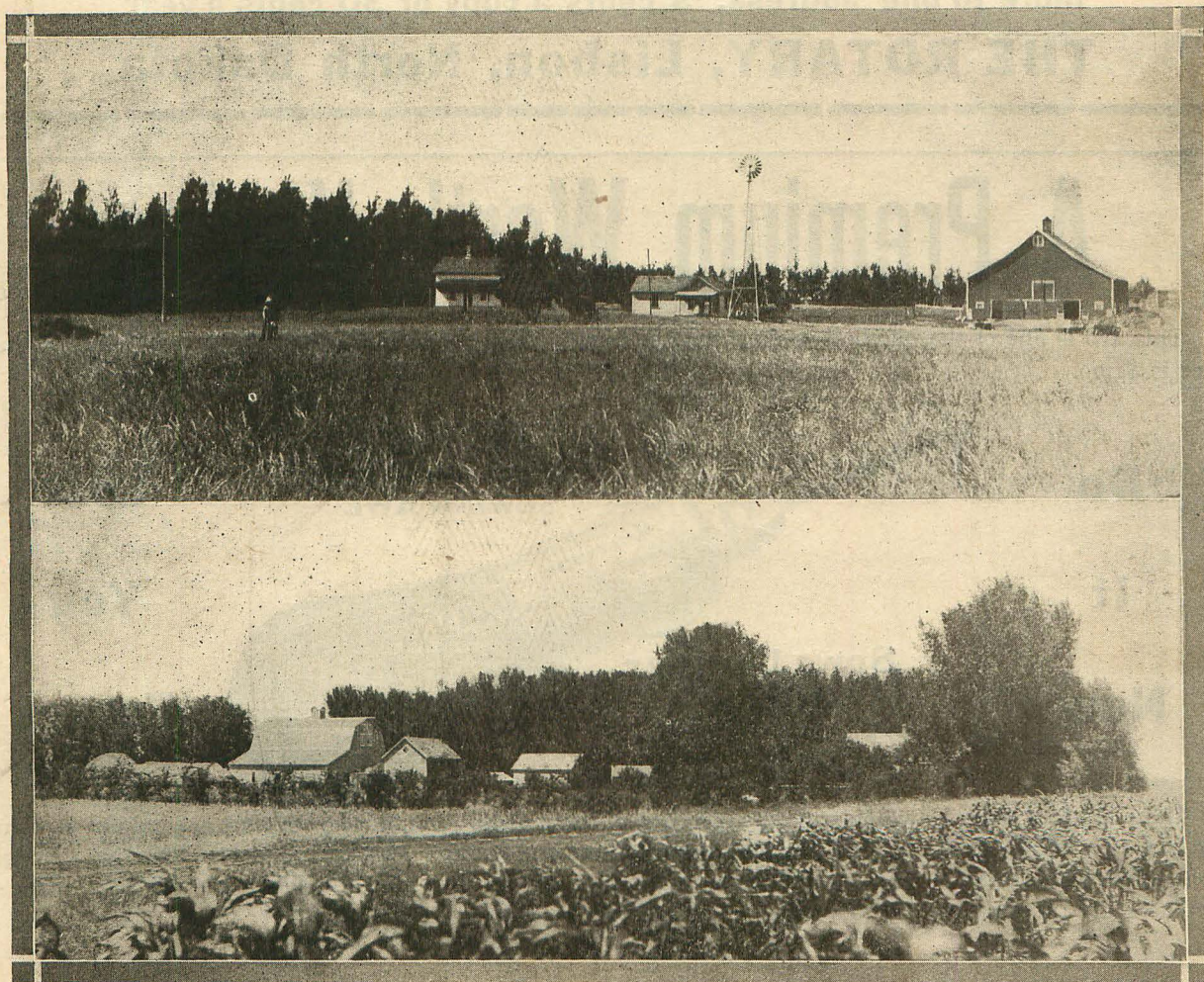
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Lisbon, North Dakota, August 15, 1910

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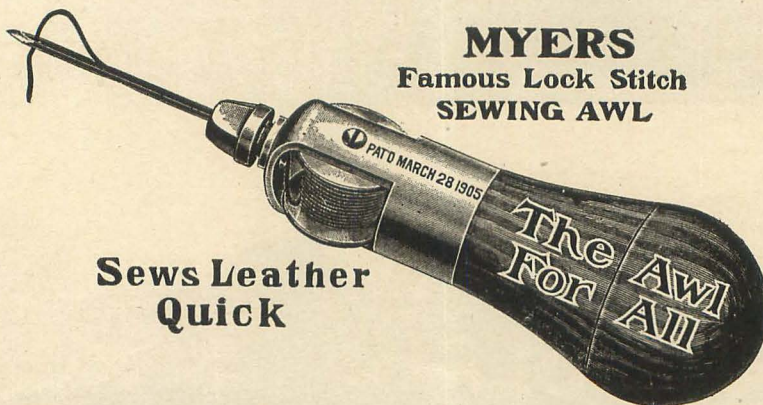
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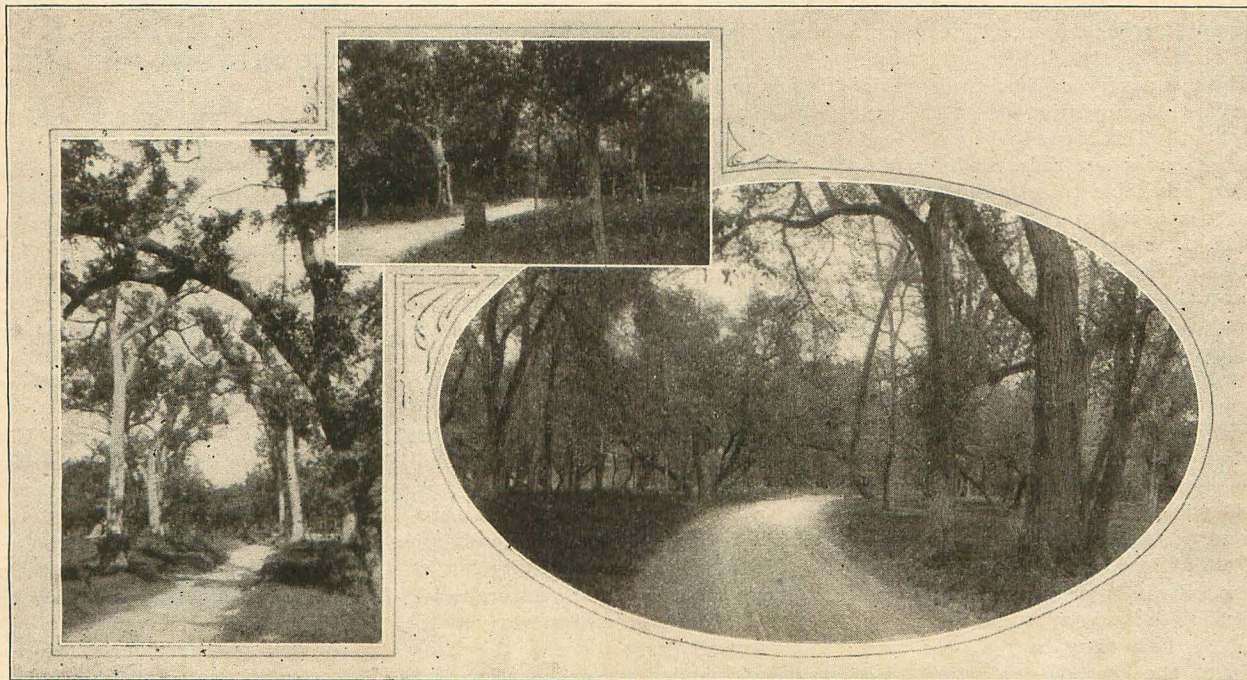


# THE NORTH DAKOTA FARMER

Vol. 12, No. 2

LISBON N. D., AUGUST 15, 1910

50 Cents a Year



Scenes on the Sheyenne at Valley City

## Real Economy in Farming

### IMPORTANCE OF GOOD ROADS

By W. C. Palmer, Agricultural College.

The value of good roads is often not appreciated by the farmers as much as it should be. Of course the burden of making better roads falls directly on them, which is another side to the problem. The average cost of hauling a ton one mile on the ordinary country roads is 25 cents, while the average price of hauling one ton one mile on the railroads is  $\frac{3}{4}$  of 1 cent. In other words, the cost of hauling is 33 times as much with team and wagon as with steam. This has been accomplished by a number of factors. Some of these can be and must be considered in making good roads, that is, to have a good hard road bed and to eliminate grades. The railroads do not as a rule have a grade of more than 3%,

some of them have adopted 2% as the maximum grade. Two per cent would mean a rise of 2 feet in a 100 feet. This would not be considered much of a grade on the ordinary road, but this is the way it works out.

A team can exert a pull on a short distance of  $\frac{1}{2}$  its weight, but for ordinary work the load it can pull should not be over one-tenth the weight of the team, for instance a team weighing 3000 pounds can exert a pull of 300 pounds, that is when it is to continue the work for say 10 hours. While for a small stretch it would be able to exert a pull of 1500 pounds. This, however, is putting forth all the energy of which they are capable. It has also been found that the pull required to take a ton over the ordinary roads is 160 pounds. Supposing then that the load is one ton and the wagon weighs 1300 pounds, this

would make a total of 3300 pounds, and at the rate of 160 pounds per ton would make a total of 264 pounds, a little less than the team is capable of hauling. In fact it could very nicely handle 500 pounds more which would bring the pull up to 300 pounds, and making the load 2500 pounds. This, however, is for the level. As a grade is approached this, of course, will be increased. A 5% grade would increase the draft of the wagon and load 3300 pounds by 315 pounds, bringing it up to 579 pounds which is almost twice what the team can handle as a regular thing. If the grade is increased to 20% or 20 feet in a hundred feet the draft on this same load would come to a little over 1500 pounds, or the maximum that this team could pull when exerting its utmost power. Any grade beyond this would mean that the load would have to be reduced, and



in fact no team should be required to have to pull to its maximum capacity. From this then it is evident that increasing the grade increases the draft very fast and hence grades should be eliminated as far as it is possible.

On the Macadam road a team can pull three times as much on the level as on the good earth road, but the increase in draft up grade remains the same as on the earth road, so that a grade would be more objectionable on a Macadam road than on a poor road. On the level a 3000 pound team could easily handle 4 tons, while the maximum grade that it could pull up with such a load would be a 10% grade, and even that is more than should be expected from the team.

There is a very marked tendency in the West of running roads on the section lines. This is good where the land is level, but where there are hills it is usually advisable to go around rather than to go over them, at least where this can be done, and thus avoid a steeper grade. There is also this objection to cuts and fills that it brings up a soil that is not good for road making and one that washes easily, and the expense of cutting down hills is usually greater than would be the cost of buying a right-of-way around the hill and thus avoid the grade. Railroad engineers will make considerable curves in the roads in order to avoid grades, and they have the problem very carefully studied out and they will often times make a detour of a good many miles in order to avoid a grade.

Having to haul the produce from the farm to the market over a poor road adds to the cost of production, and again a good road that can be depended on in all seasons brings the farmers several miles nearer town and it also increases the value of the land considerably as the buyer will pay quite a bit more for land that he can reach with a good road than for land that is hard to reach on account of poor roads, due either to steep grades or to the poor quality of the road bed. The main thing in a new country, however, is getting the roads laid out in the right place, as it is not an easy matter to change them after they have once been established and money expended on them.

#### FARM MECHANICS

By R. M. Dolve, Agricultural College

Any one who has given the subject even the most cursory examination will readily agree that the prevailing system of repairing our earth roads once a year is woefully deficient. Our system of maintenance is at the bottom of most of our road trouble and it is useless to expect better roads as long as it remains in vogue. With the present system our roads deteriorate to such an extent that

all the available road funds are required to put the road back into as good condition as it was when last repaired. In this way our roads remain at a stand still and no true progress results.

In order to make our roads good the greater part of the year a system of continuous maintenance must be adopted. Many have argued that every farmer should keep in repair a certain definite piece of road near his farm but this system, altho often productive of a great deal of good, has never been entirely successful. The trouble is that the farmer has too much important private business to attend to and cannot always give the road his attention when the condition of the road requires it. Then too this system is against the tendency of the times which is for division of labor and intense specialization.

The present day farmer is a specialist in the true sense of the word. He no longer concerns himself about the making of his shoes, clothing, tools or other equipment; he no longer worries about the bringing of his mail and the time is coming when he should no longer bother about the direct maintenance of his roads. The farmers' mail is brought to his door and he takes it as a matter of fact, stopping to consider the system which brings it there only when the mail for some reason or other fails to appear. Likewise the ideal system of road maintenance is one by which the roads are kept in repair as automatically but as surely as the delivery of the rural mail.

One of the best implements yet devised for repairing roads is the King split log drag or some modification of it which may be made either of wood or steel. The roads should be dragged with this implement as soon after a rain as possible; when the drag squeezes the water out of the soil leaving a smooth layer of puddled soil on the road surface which bakes hard when dry and "sheds water like a duck". The effect of the drag is accumulative in a way very much similar to the application of paint on a building—for, the thinner the coats and the greater the number the more lasting is the paint. Every time the drag is used a new layer of puddled soil is smeared on top of the previous one until, after several years of the accumulative effect of dragging, a road crust, consisting of a large number of thin layers of puddled soil is formed that will support the heaviest traffic without breaking up. The drag not only keeps the road smooth and well crowned but also keeps the ditches clean so that, if outlets are provided for them as there should be, water will run away from the roads and the grade thus remains firm.

There is a total of seventy-two miles of road in a township but usually less than thirty-five are travelled to any extent. In many townships one man and

two horses could maintain the roads perfectly thruout the summer months with a road drag. In other two men and four or six horses would be required to do the work when it should be done. This system of maintenance would not be at all prohibitive and it would be found that in old townships where the roads are already graded there would be little use for the road grader. About the only repair that would have to be attended to outside of this system would be the building of bridges and culverts and this could, in time, be almost eliminated if reinforced concrete were used in their construction wherever possible.

#### LEVEL CULTIVATION SAVES MOISTURE

By W. C. Palmer, Agricultural College

Level cultivation saves moisture. When the land is ridged it is put in a condition for getting rid of moisture, as there is more surface exposed and the furrows make a splendid place for the rain to run off. Where there is too much moisture it is an advantage to throw the soil up around the plant and to leave the furrows for the surplus rain to run off in.

In North Dakota and the Northwestern states we need to put forth every effort to save the moisture and the more level we can leave the surface the less there will be of it exposed to the air, wind, and sunshine, and then when it does rain it will have to soak in as there will be no channel for it to run off in. Then again the ridges and furrows are bad in that the soil in the ridge dries out so that the plant roots do not have as much surface soil to grow in as under level cultivation and it is out of the surface soil that the plant gets nearly all of its food. Deep plowing and level cultivation is the best way to save moisture, to give the plant roots feeding surface, and to keep the soil in fine tilth. This applies equally well to corn, potatoes, vegetables or trees.

#### THE CARE OF BINDERS

By R. M. Dolve, Agricultural College

Of the large retinue of mechanical serfs at the command of the American farmer today, the self binder is, perhaps, the most important. Its place could not be filled by a score of men with cradles and rakes, and, if properly managed, it has greater efficiency and is much more subservient to the master's will than the human slave of old. Since the early history of the binder the necessity for great efficiency and capacity has steadily increased. Not only is the cost of labor greater but the new soil formed at that time produced a strong, healthy straw that stood up well when



ripe and a delay in harvesting was not so serious. At present, on account of the ravages of rust and other diseases, the straw often breaks badly even before the grain is ripe, so that the profit of a crop is often dependent upon the dispatch with which it is harvested.

Notwithstanding the fact that the success of an entire year's work may depend upon the binder the neglect and abuse to which it is subjected by a large number of farmers is proverbial. It is not uncommon to see a binder stored away in the corner of the field where it was last used or in some exposed part of the yard with the twine box full of expensive pure manilla twine and the reel hoisted as high as possible as if it were desirable to have it thoroly exposed to the breeze. By the time it is to be used again the master wheel will probably have sunk deep into the soil, while the pole and neck yoke are allowed to rest on the ground. Nature as if ashamed of the deplorable shiftlessness of its co-partner will often hide the evidence of his neglect by a luxuriant crop of weeds.

Under these conditions it is small wonder that the average life of a binder is short. While the farmer complacently measures its life in years, its real usefulness may be counted in days. A binder is used on the average not much more than two weeks a year and lasts about five years, which gives its period of usefulness of approximately 70 to 100 days. That this time could be indefinitely increased by better care and management and that neglect and mismanagement result in short-lived machines, improper work and large expenses for repairs is obvious.

Considering the high price of binders together with their comparatively short life and the short time they are used each year, few better investments can be made by a farmer than that of providing adequate shelter.

Before binders are put away after a season's work they should be gone over with the same care that a good engineer would bestow on his engine. All old grease and dirt should be removed from the surface as well as from the bearings. This can be done with kerosene and waste. The binder should be carefully oiled and all bright parts greased to prevent rusting. After the season's work is over is also the proper time to repair and overhaul a binder for next year. At this time the operator knows or should know, all the defects of the machine and what it needs in the line of extras and repairs to refit it for the next season's work. If the machine is put away, on the other hand, without being given a second thought until needed again, the operator, if he still remains on the place, will have forgotten what the machine most needed. The

result is that the binder is perhaps, given a hasty inspection, which in a majority of cases fails to reveal anything, and brought out into the field with numerous small defects that could have been repaired at a nominal expenditure of time and money. If the farmer is too busy to attend to repairs immediately after the season's work is completed, he should at least find time to do the next best thing which is to make a thoro note of all defects of the machine with a view to remedying them when time is more plentiful.

Binders are often operated by inexperienced or careless persons, who, knowing nothing about the machine they are using, sit serenely in the seat and do nothing but drive. Such men are as surely out of place as they would be on an engine platform. A binder operator should be familiar with and understand the proper function of every part of his machine, and, what is more, he should be able to make all necessary adjustments and repairs without the aid of an expert. He must know where to oil, when to oil, and how to oil. Many a good binder has been prematurely relegated to the scrap-pile because of improper oiling. The man who gives his binder an oil bath when starting and then fails to oil again until it fairly screams for more may succeed in using a great deal of oil but his binder will soon wear out. All oil that does not get into the bearings does more harm than good as it serves to gather dust and grit which will work into the bearings. The proper way to oil is to use a little at a time and often. All parts of a binder do not need the same amount of oil and the operator should decide which parts, by virtue of their work, need the most and give them frequent oiling while other parts require only occasional applications.

Co-operation among farmers for the purpose of securing an equitable price for their products is one way of making farming pay and is to be encouraged. But, since the profit from farming is the difference between the selling price and the cost of production, an equally efficient way of securing the desired end is to reduce the cost of production. A great reduction can be effected by better care and management of such machines as the binder, for in North Dakota nearly one-fifth of the entire value of our crop is invested in farm machinery. If thru better care and management the average life of our farm machines could be increased by a single year a tremendous saving would be effected.

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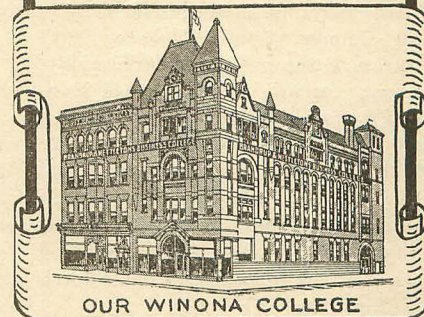
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# Alfalfa

By J. C. McDowell, Assistant Agriculturist, U. S.  
Department of Agriculture, Waukesha, Wis.

Of all the crops I have seen this dry year as I visited various sections of Michigan, Wisconsin, Minnesota, and the Dakotas, none is giving the farmer greater satisfaction than the well established fields of alfalfa. In this territory I have examined hundreds of alfalfa fields this summer, and I have not yet seen one that was planted right and thoroly inoculated that is proving a failure. In many sections of this territory, the one crop that is green and thrifty above all others, is the deep-rooted alfalfa. I do not wish the reader to infer from this that it is easy to grow alfalfa, or that all the fields in this section are successful, as it is only the inoculated fields that have been planted according to our best knowledge of alfalfa culture that amount to anything. Alfalfa that was planted on impoverished soil, on land that was carelessly prepared, on acid soil, on low wet ground, or alfalfa that was not either naturally or artificially inoculated is and must always be a failure.

It would be well worth while for every farmer in the Dakotas to make a careful study of the best methods of growing alfalfa, because it gives promise of becoming one of our most important and successful crops. In this section it makes excellent hog pasture, gives large yields of hay in good years and fair yields in dry years, withstands drouth as well or better than any other crop that can be grown here, and when once well established it does not have to be reseeded for many years.

After many failures the farmers of Hand County, South Dakota, have learned how to grow alfalfa successfully, and next year will bring about the seeding of a considerable acreage in this county. The past few days I have visited a number of farms in Hand County on which alfalfa is grown on a small scale, and as I write I see about twenty thrifty looking hogs pasturing on a small field of alfalfa six miles north of Wessington.

Under the direction of our Department, this field was sown without a nurse crop a year ago last spring. The soil had been well manured and planted to a cultivated crop the previous year, and while somewhat weedy it was in very good tilth. Owing to the manure and the good condition of the soil the alfalfa made a vigorous growth last year, and before the end of the season the whole field was thoroly inoculated. The following spring the alfalfa started

early to make a rapid growth, but when about six inches high it was cut down by a heavy frost. Rallying from this, the portion that was set apart for meadow grew rapidly, and from the first cutting yielded close to three tons of excellent hay per acre. The second crop has suffered considerably from the drouth, but all the plants are alive and quite thrifty. This crop is to be cut for seed, and at the present writing it appears to be filling well.

A portion of the alfalfa field was reserved as hog pasture, and has furnished a large quantity of excellent pasture all summer. The owner, Mr. Andrew Thompson of Wessington, tells me that he has never seen anything like this alfalfa for hog pasture, and that if the season is favorable next year he intends to sow ten or twelve acres. The new seeding will be prepared as described above, except that a light nurse crop may be used, and the land will be carefully inoculated with soil from the old alfalfa field.

What has been accomplished with alfalfa on Mr. Thompson's farm can be duplicated on almost any farm in the central part of the Dakotas if we only take the trouble to prepare the soil properly, and I do not doubt but that we can accomplish fair results with alfalfa in almost every part of North and South Dakota. In my article next month for the North Dakota Farmer I shall attempt a detailed outline for the successful establishment of alfalfa fields in the Dakotas.

## AGRICULTURE IN ALASKA

Would you care to run a truck farm with strawberries selling at \$1.25 to \$2 a quart, cucumbers \$2 to \$5 a dozen, celery 50 cents each, tomatoes 50 cents to \$1 a pound, and other products at proportionate prices? Or would you prefer general farming, with a few pigs and chickens as a side line, with hay selling at \$60 to \$100 a ton, hogs 30 cents a pound, young pigs 75 cents a pound, and eggs \$2 a dozen?

These prices are received in Alaska under favorable market conditions, but the prospective settler should consider the difficulties and expense of farming as well as the high prices of his products.

Alaska is not generally given much consideration from an agricultural standpoint, and yet, despite the rigorous climate, a large variety of grains, small

fruits, and vegetables are being successfully grown. Experiments are being made with tree fruits, but the results thus far have not been very encouraging. The work conducted by the Government with grains at the Rampart Experiment Station has been an unqualified success. Varieties of nearly all grains have been found that grow well.

A cattle-breeding station at Kodiak is working to develop the milking qualities of Galloway cattle, as they are the most hardy and best adapted to the climate. It is believed that this will be accomplished. The object will be to furnish hardy, acclimated cattle to settlers in the country at a price not higher than the cost of taking them from the United States. The coast region is well suited to the raising of cattle.

There are several successful farmers in the vicinity of Fairbanks, some of whom are general farmers and others are running market gardens. While they are meeting with some failures of parts of their crops by frosts and cold and wet summers, yet they are learning by experience to overcome many of the discouragements of the climate.

The climate shows a wide variation, from 90 degrees Fahrenheit at Rampart, on the Yukon River, in July, with an average for the month of 63 degrees, to 69 degrees below zero at Fort Egbert, near the Klondike gold fields, in January, with an average for the month of 40 degrees below zero. The coast towns are mild for that region, neither Sitka nor Kodiak reaching zero during 1909, while Juneau only reached 5 degrees below in January, with a daily mean for the month of 14.15.

The Annual Report of Alaska Agricultural Experiment Stations for 1909 has just been issued by the U. S. Department of Agriculture and is for sale by the Superintendent of Documents, Government Printing Office, Washington, D. C. It gives a complete report of the work being carried on at the four experiment stations, together with extracts from letters written by growers showing results with different seeds furnished by the stations.

## WINTER GRAIN

Winter grains when they come thru the winter safely are the surest crops to grow. They get a good start in the fall and in the spring they make so rapid a growth that they mature before the warm dry weather sets in.

Rye is the surest of our winter crops. So far the best variety is N. D. A. C. 959 which was developed at the Agricultural College. In trials it has proven to be much hardier than any other variety tried in the state. It is well to sow the rye early in September and of course the better the seed bed the better the suc-



cess. Another advantage of the rye as well as of winter wheat is that it grows so rapidly in the spring that weeds like wild oats and kinghead are held back and then it ripens before these do, so that they are weed killers as well as good yielders.

In regard to the winter wheat I wish to quote from Prof. Shepperd's address before the Tri-State Grain Growers' Convention: "I have nothing better than Turkey Red winter wheat to name to you now. It is a hard winter wheat. It sells at about 7 cents under No. 1 Northern on our Northwestern market. Sow about  $4\frac{1}{2}$  pecks per acre. It stools pretty heavy and that amount will be enough for good land. I believe it is better to sow it early in September

than to wait until later in the fall. Getting thru the winter season is the rub with it usually. Some of us have sown it in stubble after the spring grain crop was taken off. I feel kind of ashamed of it and would not seed it that way except upon land that is rich and in a mellow nice condition. It would be folly to stubble it on land that is either poor or hard. I like the idea of sowing it in standing corn with a one horse grain drill—lots of work, but it is pretty safe that way; the stubble of the corn forms considerable protection to it. One farmer tells me that he leaves every 4th row of corn stand as a snow catcher to protect his winter wheat. It must have winter protection."

## Make The Most of It

By J. H. Worst, Agricultural College

Complaint comes from over a wide area of country that, owing to the prevalence of drought there will be a general shortage of feed for livestock. Many are talking seriously of selling their sheep and cattle. In some instances this may be advisable, but selling off livestock should not be resorted to unless it is absolutely necessary to do so. The country has suffered too long already from the absence of livestock, and now when domestic animals are just beginning to multiply on the farms of North Dakota they should not be disposed of except in extreme cases, when it is evident that fall and winter feed are absolutely unobtainable. Every means should be resorted to to grow late roughage, utilize straw and hay held over from last year, or even to feed much of the wheat, oats and barley that has been cut, without threshing. But few fields that will not cut half a ton or more per acre and the heads containing considerable grain, immature or otherwise, will make rich winter feed for cattle when fed as hay.

To throw livestock on the market generally will result in such a slump in prices as to make farm animals almost valueless. Another fact should be taken into consideration; every year that the precipitation is below normal the crop yield will depend very largely upon the amount of vegetable matter contained in the soil. Without livestock on the farm to supply coarse manure the vegetable matter in the soil becomes less and less as the years go by. In consequence more and more rainfall, as well as more **seasonable** rainfall, will be required to produce sure crops. There is therefore the very strongest reason for increasing rather than diminishing the number of domestic animals kept on the farms of the state. The question of maintaining

the fertility of the land also associates itself thus directly with conservation of moisture, thru the medium of barnyard manure, one of the principle advantages arising from diversified farming.

Cultivation has much to do also with the retention of moisture. All taken together constitute the distinguishing characteristics of the good farmer.

As in any other kind of business the farmer should look ahead and be prepared for abnormal conditions; to be as far as possible fortified against adverse weather conditions as well as fortified against insect and fungus depredations.

Almost any sort of farmer can prosper when all things are normal, but the science of agriculture enables the farmer to a great extent to eliminate the element of chance. Nature does much for agriculture, but also leaves much for the agriculturist to do which requires positive knowledge of her laws and how to direct them.

Where the normal rainfall is not in excess of 20 inches it is folly to risk a season's investment of labor and capital, then permit weeds and lack of vegetable matter in the soil and meagre cultivation to dissipate so much of that 20 inches of moisture as to injure the crop. However, should an abnormal season come, as will occasionally happen, and only about 60% of the usual amount of rainfall be had there can be but one result—crop failure. Had the plowing been properly done, the ground disced and dragged thoroly and repeatedly, the weeds destroyed and the fields regularly manured and clovered, even then as good a crop might be realized with very limited rainfall as the weedy and impoverished fields would produce under normal conditions. Any state or portion of a state that requires the full nor-

mal rainfall, with ordinary cultivation, to produce an average crop is bound to suffer from frequent crop failures unless the farming is done so well every year that the evil effects of limited or unseasonable precipitation is thereby overcome. Should the season prove favorable the good farmer is far ahead of his competitors, while under more adverse conditions the good farmer still has a fair crop when the careless neighbor loses his season's work. This may appear like academic verbiage, and it is; yet there seems to be a valid reason for perpetrating it upon a large number of North Dakota farmers. It is intended, however, for their good.

I consider livestock so essential on every farm, for reasons already stated, that I question whether any farmer can make continued success of his business without engaging in animal husbandry. We are so near the end of the exploiting period in many parts of the state that livestock must be resorted to as a **remedy** as well as for the money profit there is in the animals themselves. Use your ingenuity, therefore, and see if you cannot find a way to rustle sufficient feed to keep your livestock on the farm.

### USE OF PEA VINES FROM PEA CANNERIES

In the early history of pea canning, the pea vines were treated as a waste product, the disposal of which involved considerable difficulty and expense. most commonly they were thrown out in piles to rot, the resulting manure being used for fertilizer.

During recent years, the pea vines have risen to the dignity of a by-product, from which the factories derive considerable profit. They are now utilized for silage, or fed to stock in a fresh state, or cured for hay. They make a silage superior in value to corn silage. They may be preserved in silos the same as green corn, or they may be put up in large stacks in the open air. If these stacks are well put up and the vines are well tramped, decay will only affect the surface to the depth of a few inches.

The U. S. Department of Agriculture has recently made an extensive investigation of this subject and published the results in a circular.

The pea vines can easily be cured by spreading them on sod land. Pea-vine hay is considered better than clover hay.

Both the hay and the silage are excellent feeds for dairy cows. They are also satisfactory feeds for beef, cattle, horses, and sheep. The hay sells at \$3 to \$5 a ton.

In some cases the pea vines are hauled away from the factory by the farmers who supply the peas; in other cases they are sold in a fresh state; and in still other cases the factories either silo the vines, or cure them for hay.



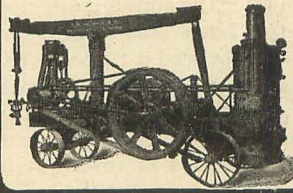
## BIRDS OF CALIFORNIA IN RELATION TO THE FRUIT INDUSTRY

The Department, having concluded its investigations as to the harmful or beneficial effect of California birds upon the fruit industry of that state, has issued the second and final part of its report in Bulletin No. 34 of the Biological Survey. Seventy species of the feathered denizens, among them some of the most important birds of the state from the farmers' and fruit growers' standpoint, were systematically investigated. It is true that many of them have not been charged with the destruction or injury of fruit or any other farm product, but as almost all destroy great numbers of harmful insects, or devour seeds of noxious weeds, they are important as a factor in farm economics, and the aim has been to collect all data possible on the food of the several species, so that a just verdict might be rendered as to the birds' economic relations.

Few birds are always and everywhere so destructive that their extermination can be urged on sound economic principles; some, like the swallows, swifts, wrens, and chickadees are so strictly insectivorous that they are exceedingly beneficial, while others may injure crops at certain times of the year, but the loss is exceedingly small, and if by its insectivorous habits the bird prevents much greater destruction than it inflicts, the farmer should be willing to bear the lesser loss.

A reasonable way of viewing the relation of birds to the farmer is to consider them as servants, employed to destroy weeds and insects, for whom sufficient food and needed protection is generously provided. In the long run, no part of the capital invested in the farm or orchard is more certain to pay big interest than the small sum collected as toll by the birds that harbor near the premises. Deductions from the extensive investigations undertaken in response to numerous complaints concerning depredations by birds in orchards and vineyards on the Pacific coast, show that the food habits of the seventy species, whose stomach contents were under examination, indicate that but four species common in California can be regarded as of doubtful utility. These are the linnet, California jay, stellar jay, and red-breasted sapsucker. Therefore, when all the known methods of protecting fruit have been exhausted, or can not be profitably employed, a reasonable reduction of the numbers of these offending birds is permissible; but the more the food habits of birds are studied, the more evident is the fact that with a normal distribution of species and a fair supply of natural food, the damage to agricultural products by birds is small as compared with the benefit.

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## JACK PINE PLANTATION

(*Pinus divaricata*)

This photo shows part of the experimental plantation designed and established by B. E. Fernow when chief of the Forestry Division, U. S. Department of Agriculture. Many different species were planted, but Jack Pine did best of all.



This plantation is on very sandy land, where the sand drifts when sod is broken. The plants, when set, were seedlings about ten inches high. They were supplied by

H. B. AYERS, of Kimberly, Minn.,

who now has a nursery devoted exclusively to the propagation of Jack Pine for prairie planting.



# Mixing Concrete on the Farm

## How to Select Your Materials and Mix Your Own Concrete

On account of its cheapness, uniformity, and quick development of strength, the only cement practically used at present is the kind called "Portland." There are almost as many brands of Portland cement as there are of wheat flour. For farm work choose some brand guaranteed by the local dealer to meet the standard specifications of the American Society for Testing Materials, which standards are approved by the National Government.

Cement takes water so easily that care must be exercised in storing it. Upon the regular floor of a good building place timbers close together, as a support for a false floor, upon which the cement should be piled.

### Keep the Cement Dry

Cement is heavy; do not overload the floor of the building by piling it too high, and do not store it against the side walls. Keep it covered with canvas or roofing paper. Cement once wet sets up and is unfit for use. However, lumps due to pressure in the store house must not be mistaken for set-up cement. Such lumps are easily crumbled and may then be used.

### Do not Buy Stone Screened to One Size

Concrete is a mixture of Portland cement and particles of stone. The stone should vary in size from pieces one inch in diameter to sand grains. By so grading the stone, the smaller particles fit in the spaces between the larger pieces, thereby producing the most compact and the strongest mixture.

The best stone for crushed rock is one which is clean, hard, and breaks with sharp angles. Trap, granite, and hard limestone are among the best; the use of shale, slate, and soft limestones and sandstones should be avoided. The crushed rock should be screened on a  $\frac{1}{4}$ -inch screen to remove the fine particles. These small particles should be considered as sand; and, if insufficient in quantity to make the proper proportion of the concrete, as is described later, enough sand should be added to them to produce the required amount.

### Well-Graded Gravel Good

Gravel well graded in sizes is at least equally as good for concrete as crushed stone. Bank-run gravel, just as dug from the pit, seldom runs even and rarely has the right proportion of sand and pebbles for making the best concrete. The mixture most suitable has one part sand to two parts gravel, measured by volume, in which all sizes passing thru a 1-inch-mesh screen and retained on a  $\frac{1}{4}$ -inch screen are considered gravel. As there is usually too much

sand for the gravel, it is both advisable and profitable to screen the material and to remix them the proper proportions. Gravel should have no rotten stone and should be clean, so that the cement may adhere to it tightly.

### Sand Must be Clean

With dirty sand, no amount of cement will make strong concrete. Generally sand is clean, but if not, it can easily be washed by playing a hose or flushing water upon thin layers of sand placed on a tight-jointed inclined wooden board. In size of grain it should vary uniformly from fine to coarse. All particles passing a  $\frac{1}{4}$ -inch screen may be considered sand.

Any good-tasting drinking-water is suitable for concrete.

### No Great Expense for Tools

The tools and equipment necessary for making concrete in moderate quantities are already at hand on a well conducted farm, or will be useful afterward for other purposes.

The list: 2 square pointed "paddy" shovels, No. 3; 1 round pointed tiling shovel or 1 garden spade; 1 heavy garden rake; 1 sprinkling can or bucket or 1 spray nozzle for hose; 1 water barrel or 1 length of hose; 1 sidewalk tamper or home-made wooden tamper; 1 sand screen made of a section of  $\frac{1}{4}$ -inch wire mesh nailed to a wooden frame; 1 measuring box or frame. See description further along in article; 1 mixing board; 2 wheelbarrows with steel trays.

### Proper Proportions for Farm Work

For farm work the following proportions are most suitable: For concrete necessarily waterproof 1 : 2 : 4 or 1 : 4; For all other ordinary purposes 1 : 2½ : 5 or 1 : 5.

Such proportions of three parts, as 1 : 2 : 4, indicate that the concrete is to be mixed 1 part cement to 2 parts sand to 4 parts screened gravel or crushed rock; and 1 : 4 that it is to be mixed 1 part cement to 4 parts bank-run gravel.

Measurement by counting shovelfuls is poor and uncertain practice. To avoid splitting of bags of cement, make as the unit of measurement 1 cubic foot, the amount of loose cement contained in one cement bag. Such measurements are one cement bag. Such measurements are made a very easy matter by gauging the wheelbarrows. For this purpose use a bottomless box holding one cubic foot. A shallow bottomless frame is also a convenient means of measuring. Such a frame, when set on the mixing board and filled, should contain the full

amount of sand or one-half the quantity of gravel, or crushed rock, required for one batch of concrete.

### Using A "Two-Men Board"

The size of the batch is dependent upon the amount of help and the dimensions of the mixing board or platform. For work of ordinary size, sufficient room will be had on a "two-men board," 8 by 14 feet, framed solidly and covered with one-inch stuff with tight joints the short way of the board. A wooden strip nailed around the outer edges will prevent the loss of liquid cement.

### Labor-saving Factors in Mixing

All the materials (slightly more than the computed quantities) should be on hand before beginning the work. They can often be hauled at odd times. The sand and gravel or stone should be piled so as:

To cause the least amount of wheeling.

To make the mixing most convenient to the water supply.

To allow room for the future location of the mixing board.

If the gravel does not need screening, place a bottomless frame, previously described for a 1 : 4 mix, on the mixing board and fill it level full with gravel. Lift the frame, spread the gravel slightly with the garden rake, and upon it distribute evenly 2 bags (the full amount) of cement. Set the frame upon the leveled surface of cement and gravel and again fill it in the same way.

### Mix Carefully with a Rake

Remove the frame and spread the entire mass by dragging it back and forth with the rake. Two men, opposite each other, then turn the batch with the square pointed shovels. Again use the rake. Keep turning until the cement no longer shows in streaks, until the mixture has a uniform color. Throw the mixture has a uniform color. Throw up the ragged edges and, with sprinkling can or hose with spray nozzle, apply water in quantity, according to special directions given later for each particular kind of construction. Turn again and add so much more water as may be required. If dry streaks are still evident, continue the turning until they disappear. With wheelbarrows quickly remove the concrete and immediately use it in the work.

If crushed rock or screened gravel is to be used, fill the bottomless frame with sand and distribute upon it 2 bags of cement. Drag the materials back and forth with the garden rake, then turn, as described above, until the mass has a uniform color. Spread the mixture so that 2 framefuls of crushed rock or screened gravel may be placed upon it. Wet the mass and turn as for bank-run gravel until each stone is coated with cement mortar. Remove as for the gravel concrete.



For the proportion of 1 : 2½ : 5 or 1 : 5 the method of mixing is the same.

Since crushed stone is more or less porous, in dry hot weather it is advisable to keep the stone pile wet or at least to water the stone well as it stands on wheelbarrows ready for the mixing board.

#### No Vast Amount of Knowledge Necessary

No vast amount of knowledge and experience is necessary to do first-class work in concrete. Success is dependent upon the care and thoroughness exercised in the Selection of the materials; Mixing of these ingredients, and Protection of the freshly placed concrete.

The placing and protection of concrete and simple schemes for saving time, labor, and lumber in the construction of forms will be considered in the next article on "Forms for Concrete."

#### TO THE FLAX GROWERS OF NORTH DAKOTA

This is one of the driest years that North Dakota farmers ever experienced. Flax on old flax lands has not only had to compete with wilt but it has suffered under drouth conditions more severely than the crop can usually withstand.

Many farmers who have sown flax on old flax lands find that the wilt in connection with the intense drouth has been very severe.

I am writing this to say that no farmer should allow the fact that there is only a small amount of flax seed produced in the crop per acre to prevent him from saving the seed which does grow, for the flax plants which are able to withstand both drouth and wilt will produce seed which is of the highest value.

Even flax which is quite thoroly resistant during ordinary years is unable to withstand the wilt and canker under the excessive drouth conditions that have prevailed in parts of the state.

Those who have any flax which has survived under these very discouraging conditions should save every bit of the seed for sowing purposes as it will be of much value to them in future years.

Remember that it is the old story of the survival of the fittest, which is in action under such hard growth conditions.—H. L. Bolley, A. C., N. D.

#### NORTHERN PACIFIC INCREASES FACILITIES

##### Developing Transportation Lines in North Dakota

The Northern Pacific is actively engaged in developing transportation lines in North Dakota.

The contract has been let for a railroad from Pingree in Stutsman County to Wilton in Burleigh County, about ninety miles. This will open up some good land in Stutsman, Kidder and Burleigh Counties, capable of supporting a large

population engaged in the raising of wheat, clover and other crops and particularly in the cattle and dairy business, for which the region is eminently adapted. With the Northern Pacific Line from Carrington to Turtle Lake on the north and the main line from Jamestown to Bismarck on the south, after the completion of this new line, there will be no land in these three counties more than fifteen miles from a railroad. With this maximum wagon haul the highest development and prosperity is possible.

The Northern Pacific has finished the grading of its line from Mandan to Stanton thru Oliver and Mercer Counties, west of and lying on the Missouri River, and the metal will be laid on this grade early this season, thus finishing fifty-three miles of railroad that will help to serve the rich and growing counties of Oliver and Mercer.

Surveys will shortly be run from some point on this line up the Knife River Valley so as to furnish better transportation facilities for Oliver, Mercer and Dunn Counties. The Knife River, the valley of which is very rich and the climate pleasant, flows into the Missouri first above Stanton. It was near the mouth of this stream that Lewis & Clark passed the Winter of 1804-5 at Fort Mandan. From its sources in Billings and Dunn Counties the river first swings southward to within about twenty miles of the main line of the Northern Pacific at Richardton and Hebron. It then flows northeastward across Mercer County to Stanton. South of Mandan the grading is nearly done as far as Fort Yates, seventy-two miles, and the grading is well along from the mouth of the Cannon Ball River to Mott, thru Morton and Hettinger Counties, opening up ninety miles of

good road. It is expected that the metal will be laid on these grades in time for this year's—1910—harvest.

The Northern Pacific is also arranging to put in some additional double track east of Jamestown and to continue to improve its main line with better rail and ballast all thru the state.

From this it will be seen that the new construction by the Northern Pacific in North Dakota amounts to about three hundred and ten miles, which is a substantial addition to transportation facilities of the growing state of North Dakota.

#### THE BILTMORE FORESTS

The Biltmore estate in North Carolina is remarkable in point of variety and scope of forest work done there. The forests, which cover 130,000 acres, are made profitable by the production of various forms of material. Four million feet of lumber, 5,000 cords of tannic acid wood and fuel, 1,000 cords of tan bark and several hundred cords of pulp wood are cut every year. At the same time the forest, thru wise management is bettered and is steadily increasing in value. Workmen are employed along the boundaries of the forest as fire guards. Thus fire protection is secured at least thruout all the accessible parts of the tract. In connection with all lumbering operations permanent logging roads are built. These minimize the present cost of transportation and will greatly reduce the cost of marketing future crops. Thus the extension of the roads is steadily adding to the investment value of the forest. Moreover, they serve also as a network of fire lines. Forest planting is practiced where fire will not threaten its success.

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See Awl Offer, Page 2--A Winner



## IMPORTS OF FARM PRODUCTS INTO THE UNITED STATES

The farm products imported into the United States during the fiscal year 1907—the year of highest record—amounted in value to nearly \$627,000,000. The imports for 1908 were valued at \$540,000,000 in round numbers, and the average for the five years 1901-1905 was a trifle over \$455,000,000. These and other interesting figures appear in a bulletin recently issued by the U. S. Department of Agriculture which reviews our imports of farm products during a period reaching back to the middle of the last century.

The farm products imported may be divided into two general classes, (1) those which compete with products of farms in this country, and (2) those which do not so compete to any considerable extent. The first class, embracing such items as sugar, tobacco, hay, and hides and skins, makes up a little less than half of the total. The principal items of the second class are silk, coffee, tea, sisal grass, manila fiber, jute, bananas, cocoanuts, and Peruvian and Egyptian cotton.

Farm products have always constituted a large part of our imports, but not the preponderant share that such products hold in our export trade. In the fifties only about one-third of our imports were farm products. But their importance gradually increased, and in 1875 to the end of the century agricultural products made up just about one-half of the total, in some years rising above and in some years falling below the 50% line. Since 1900, however, while farm products have continued to increase, the gain in imports of manufactures and other nonagricultural articles has been even greater, so that only about 46% of the total imports since 1900 are to be classed as agricultural.

By comparing imports with exports it is found that for the five years 1901-1905 our average exports of cotton, grain, and grain products exceeded by \$74,000,000 our total imports of products of the farm.

Imports of agricultural products have increased much faster than population during the period covered by this review. In the period 1851-1855 these imports averaged in value \$2.71 per capita; during the five years 1901-1905 the average was \$5.67. Of this increase of \$2.96 per capita, 55 cents was due to increased imports of silk, 55 cents to packing-house products, 45 cents to vegetable fibers, 28 cents to coffee, 20 cents to wool, 18 cents to tobacco, 17 cents to all fruits, 10 cents to cocoa and chocolate, and 7 cents to vegetable oils.

Comparing the two periods 1851-1855 and 1901-1905, it is found that in

fifty years imports of coffee increased from 7 to 12 pounds per capita, imports of tea from  $\frac{3}{4}$  to 1.2 pounds, and imports of sugar from 17 to 46 pounds per capita, while during the half century imports of manufactured tobacco doubled and imports of wool trebled.

Import prices show some marked changes. Cheese rose from 9 cents a pound in 1851 to 19 cents a pound in 1908, and potatoes from 32 to 70 cents a bushel during the same period. Manila hemp, imported, direct from the Philippines, was valued at \$76 a ton in 1862, when first recorded separately among the imports; it has subsequently more than doubled in price, being rated at \$171 per ton in 1908. Philippine sugar, on the other hand, despite improvement in grade, fell from 2.9 to 1.7 cents a pound during the fifty-eight years under review, while Cuban sugar declined from 3.6 to 2.5 cents a pound. Among the spices, pepper advanced from 3.5 to 7.5 cents a pound, while nutmegs fell to 12 cents a pound, less than a fifth of the 63 cents recorded in 1851.

Raw silk imported from Italy is valued higher than that from the Far East, and of the latter the silk from Japan is higher than that from China. Brazilian coffee shows an import price little more than half that of coffee from the Dutch East Indies (Java and Sumatra), but Guatemalan coffee comes almost as high as the latter. Before 1861, however, there was little difference in price between coffee from Brazil and from the Dutch East Indies; in fact for four out of ten years the price of Brazilian coffee was the higher. In the early nineties Cuban wrapper tobacco was frequently valued below Sumatra wrapper; in the five years ending 1908 the import price of Cuban was 75% higher. The relative import prices of Cuban and Turkish filler tobacco vary considerably from year to year. Thus in 1903 and 1904 Turkish was 12.5 % higher, but in the next four years Cuban was invoiced at a rate 50% higher than Turkish.

### DOES IT PAY TO DRAIN..

Letters received by the Ontario Experiment Station from persons for whom the department of physics had surveyed drains, indicate that half of the correspondents were able to sow their drained lands 4 weeks or more earlier than undrained land, while nearly two-thirds of them gained 3 weeks or more. The cost of drainage was frequently repaid before the end of the first or second season in the increased yields of hay,

straw, grains, and peas. The average increased yields due to drainage were 25 bushels per acre in case of barley, 43 of oats, 10 of peas, 23 of fall wheat, 10 of spring wheat, 20 of corn, 35 of beans and two-thirds of a ton of hay, while the yield of straw was reported as about doubled. At market prices in Guelph and Toronto, the average gain per acre is computed at \$21.65.

### WONDERFULLY VALUABLE FARM HAND

A farm hand in one of the Ohio counties said, in telling of his troubles to a neighbor:

"The old man smokes on the front porch and the old woman knits on the back porch, while I, for \$20 a month, tend to 100 acres of land, feed and water the stock, milk the cows, gather the eggs, bring in the vegetables, chop the wood, do the churning, turn the washing machine, and help the hired girl cook the meals. When the chores are all done they send me over to a neighbor to help build stone fence."

### NEW GERMAN POTASH LAW

Since so much has been said about the new German potash law, interest has been aroused on both sides of the Atlantic as to what the proposed law really intends to do. Consul-General Robert B. Skinner, of Hamburg has forwarded a copy of the law, which needs only official promulgation to make it effective, to the Department of Commerce and Labor. To Americans, the most startling portion of this law is the opening line, which reads:

"The owners of potash works are allowed to sell potash salts only in accordance with the provisions of this act."

This means the absolute control by law of an industry in which various German governments and both German and American corporations are interested. While the government in this law refrains from taking over the potash industry as a whole for its own account, the production and sale are monopolized just as surely by the limitations which the law lays down. It is still too early to anticipate the precise effect of this legislation upon the cost of American fertilizing materials, and there are probably many questions of interpretation which will require time before settlement can be reached.

England has one great advantage over us. She can lay the blame for all her economic ills to her policy of free trade. But we have a big advantage over England too. We can blame everything in the United States to the tariff.

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## Williston the City of Opportunity

The State Editorial Association held its midsummer meeting at the city of Williston, whose good people entertained the large number of editors in a most cordial manner. The fact that 180 editors, together with their wives, attended this meeting indicates in a measure the enthusiasm manifested by

contrast the irrigation method of farming, the work of the experiment station, and the "hit and miss" method, too prevalent in the state of North Dakota. During the past five or six years the rainfall in this section has been so ample that the farmers gained the impression that irrigation and systematic agricul-



John Brugger, Mayor of Williston, who most cordially welcomed the visiting editors in behalf of Williston and her estimable people.

the visitors, while it is impossible to describe the most hearty reception accorded the pen-pushers of the state. The business meeting proved to be of vast interest and of great value to every editor present.

After the business session of each day, the citizens of Williston took the editors in charge and escorted them about the city and made excursions to the irrigation project and the experiment station. There was an opportunity afforded to

ture were fads, as their crops seemed to compare favorably with those raised under the system of irrigation or by approved scientific methods. Even some of those farmers having access to the irrigating ditches declined this year to pay the extra fee for water privileges. As a result, the irrigated crops were as oases in the midst of a desert. Tho the crops in this section are rather short the present year, yet the former years of plenty will enable the farmers to tide

over this "lean" year, but it is hoped a salutary lesson has been learned.

Many of the editors had the privilege of a long journey thru the coal mine adjacent to the irrigation project, and judging from the vastness of this one small mine, one is enabled to gain an idea of the extent of the coal deposits of North Dakota, which are said to contain one-sixth of the coal in the United States. At the irrigation plant they make use of the producer gas, by means of which one ton of lignite is made to equal two and a half tons of Illinois coal. This station furnishes electricity for the electric power used in all the pumping stations, and one cannot but foresee such development of electric power as will eventually furnish the entire state from the almost exhaustless mines of this western section.

The barbecue was a decided success. This was under the management of Attorney Aaron Bessie, a former resident of Richland County. An idea of the capacity of our editors may be judged from the fact that 2,000 sandwiches were made at the start and afterwards 400 loaves of bread were needed for additional sandwiches at this barbecue, to say nothing of the most inviting "congressional features".

To the Mayor of the city, John Brugger, Editor Whitehead, the thousands of estimable citizens of Williston, and the the railroads of the state providing transportation is due the gratitude of the visiting editors, who have returned to their homes singing the praises of Williston, the hustling "City of Opportunity."

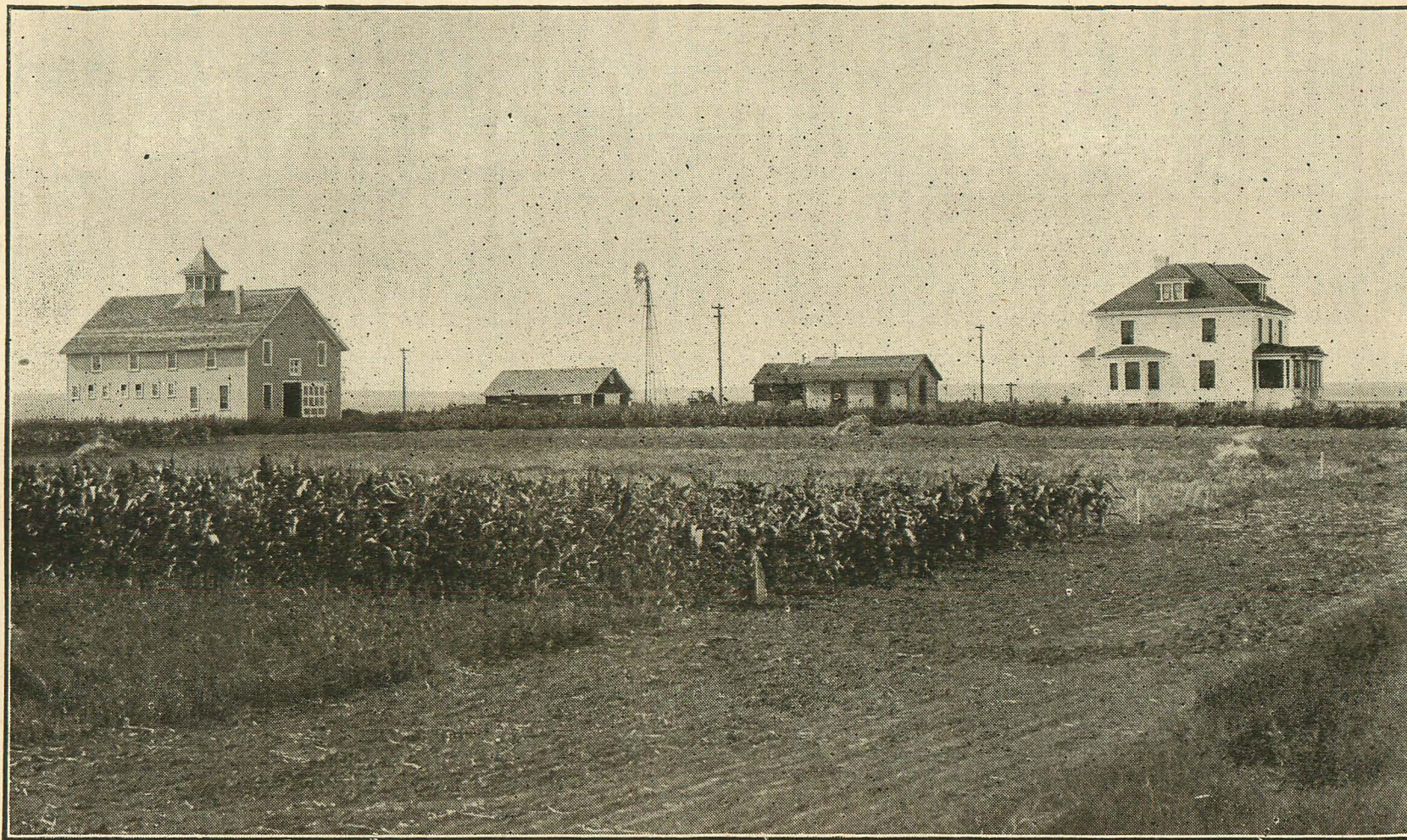
### WILLISTON SUB-STATION

By W.C. Palmer, Agricultural Col.

The results of the experiments at the Williston sub-station are of especial interest this year. They range from dry farming to irrigation farming. There has been but very little rain since the grain was planted in fact, the driest summer on record. Corn and grain on bare fallow have done well but grain after grain is giving very poor yields, in some cases, almost failure. The grain and grass growing under the ditch has done fine. The shocks of wheat stand close, and the heads are well filled. Two crops of alfalfa had been cut, the writer was there August 9th, and the third crop was making a fine growth. One piece had been left for seed and it was exceptionally well filled. So that growing alfalfa for seed and for hay is going to be very profitable. A plot grown to sugar beets shows that the soil when irrigated is well adapted to this crop.

Oats that were watered has done fine while that growing without irrigation is practically a failure. The same is true of barley. Potatoes seemed to be doing





View of the Williston Experiment Station.

better without watering than any other crop.

The fruit trees are making a vigorous growth, strawberries gave a large crop.

Winter wheat and rye were grown both with and without irrigation, and there was not so very much difference. The winter grains make their growth in the fall and early in the spring and so

mature before dry weather has much effect. This demonstrated that the winter grains are very valuable in that they are a more sure crop than the spring grains.

Last year there was not much difference between the irrigated and the non-irrigated but this year the difference is in many cases that between failure and

success. Last year blue stem yielded as high as 35.9 five wheat 32.4, barley 57.8 oats 104, and potatoes 163 and that without any watering. With irrigation big yields can be made a sure thing every year, and with crops like alfalfa three cuttings can be secured each year.

Threshing is now in progress so that soon the yields will be known and then

exact comparisons can be made between the different ways of growing the crop.

Trees of all kinds are doing nicely, and do not seem to have been affected by the drought.

The farmers who live in the neighborhood have a fine opportunity to observe the experiments being carried on.



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### PARCELS POST

Congress has adjourned, and the parcels post bills, says Wallaces' Farmer, are sleeping peacefully in the post-office committee. They will likely sleep there thru the next year, for there will be the same congress next year as this; but between this and the time congress meets you will be called upon to elect a congressman for the next congress.

Whether the men you elect give you any help or not depends largely on yourself. Let them know that you want a parcels post, at least a modified parcels post, such as the post-masters general have been recommending for years. Put this question to your candidate: How do you stand on parcels post? Say to him that the government already has postal agreements with a dozen or more foreign nations, by which we can send a package to any of these countries across the ocean for less than we can send them to a relative or friend or customer living in the next county. If these things are talked about before the election, if candidates are sharply interrogated as to how they stand on this proposition, then there is some chance of the next congress doing something. When congress meets next December, it is this present congress; but the men you are to elect will meet in the following congress, where if farmers do their duty, parcels post bills will not sleep in the pigeonholes of committees.

The question of parcel posts has attracted much attention and brought

strong opposition from country merchants but most likely the express companies are the ones most interested. Farmers have not looked into the question of parcel posts as much as they should. If you want parcel post, then you must fight for its enactment into a law. Wallaces' Farmer has the following to say regarding the benefits to farmers from having a practical working parcel posts measure.

"You ask: What do you mean by a limited or modified parcels post? Simply this, a law authorizing the sending of parcels up to a certain weight on the existing rural routes radiating from any town or city, and at a much lower rate than could be granted for an unlimited parcels post.

This limited parcels post would be a wonderful help to farmers and will not be an injury to up-to-date business men. The merchants in the small towns are opposed to it, and blindly, we think. In fact, we not only think it, but are sure of it. It may and will, we think, injure the business of those of them who are not up-to-date. It will, we believe, revolutionize the business of the small merchant, which needs revolutionizing, and has needed it for many years. This limited parcels post will help the farmer, will help the up-to-date merchant, will help the men who need help and who are worthy of help. If it injures those who are not worthy of help, it is probably the best thing that could happen to them, because it will compel them either to change their methods and catch up with the times, or go into some other business."

### DECAYED MEAT

Of late a great deal has been said with regard to the injury caused to health from the eating of food products not in proper shape for consumption. Food products, often which have begun to decay, and yet may not show by their odor the character of the changes that are taking place as a result of remaining in cold storage. In this connection it is interesting to note what is said in a recent issue of "The Character Builder," which is as follows:

"As a people, we eat meat abundantly, and of many kinds. Our forefathers did the same thing, but with this difference: They ate cured meat or fresh meat; never cold storage meat. During the last score of years we have developed a fad for fresh meat so-called, but which is not fresh meat at all. It is meat which has reached a certain stage of rottenness designated as 'ripe'—a condition acquired in two or three weeks after the killing of the animal. May not the many ills ascribed to the eating of

meat be due entirely to the condition of the meat? Does it necessarily follow that because home-cured ham and bacon have been accepted articles of diet for centuries, that cold storage pork is also good? May we not even suspect that factory-cured ham which is not smoked at all, is not the same thing that our grandfathers used? Again, the similarity between a fresh chicken and one out of cold storage consists only in the shape of the bird. Did any of our readers ever hear of a case of ptomain poisoning during all those centuries when meat was carefully cured or eaten absolutely fresh, before the time of this fad for meat ripened in cold-storage? Acute ptomain, like other deadly poisons, is so violent in its action that it forces the attention of everybody; but there is a chronic ptomain poisoning also. To it may be ascribed many forms of gastrointestinal indigestion, and it is a possible cause of appendicitis. It is our belief that cold storage meat frequently is injurious and sometimes poisonous without being odorous. We recommend this phase of the subject as worthy of close professional study and observation. In the meantime, it is safer to return to the meat of our fathers."

W. H. Swomsley, General Manager of the Pittsburg Melting Company, was arrested on a charge of violation of the Meat Inspection Law in Pittsburg on Wednesday last and taken before a United States Commissioner and bound over to await the action of the grand jury. Swomsley was released on \$2,500 bail. This report was received July 30th by the Department of Agriculture from John H. Jordan, United States Attorney at Pittsburg.

The charge against Swomsley is that of offering for interstate shipment a quantity of edible oil which had not been inspected and passed under the Meat Inspection Law. It seems that the plant of the Pittsburg Melting Company was formerly inspected by the inspectors of the Department of Agriculture, but some months ago inspection was withdrawn on account of the failure of the company to comply with the regulations of the Secretary of Agriculture. It is claimed by the Department of Agriculture that since inspection was withdrawn the Company has been making regular shipments of an edible animal oil and has induced the railroad companies to accept the shipments by marking the same "inedible." It is reported by the inspectors of the Department thruout the country that a large number of concerns, by means of this same artifice, have been shipping from one state to another and to foreign countries large quantities of edible oil which has not been inspected and passed. This is the first arrest, but it was said at the De-



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partment that vigorous steps would be taken to apprehend other violators of the law.



### DEMONSTRATION FARMS

Farmers learn by experience. No better evidence can be offered than that of demonstration. To preach rotation of crops is less effective than to demonstrate the advantages that can be realized from this rational system of farming. More and more it is becoming apparent that rotation is not only profitable, but absolutely necessary, if the business of farming is to continue our dominant industry. To prove beyond question what is claimed for rotation, twenty-four demonstration farms have been established by the North Dakota Experiment Station in as many different counties of the state. Each farm consists of about five four-acre fields. One field is cultivated to corn each year, one field is manured and one is seeded to clover. By this arrangement the entire farm is cultivated every five years, is also clovered and manured every five years. Only the best pedigreed seed is used and the ground is seasonably and properly plowed and otherwise cultivated to meet the local conditions as to moisture, inclination to blow, etc.

Three-fifths of the farm is seeded annually to wheat, oats or other small grains.

This rotation contemplates sufficient livestock to consume the corn and clover and also to furnish manure for the land. Further, it insures a diversified source of income and affords profitable employment thruout the year. As a business proposition the results speak for themselves. The six demonstration farms in operation four years yielded an average of 26.49 bushels of wheat per acre, the six in operation three years yielded an average of 22.22 bushels per acre, while the nine in operation one year yielded an average of only 14.4 bushels per acre. Three were only started this last spring.

But aside from economic results obtained, abundant evidence has been gathered to prove the necessity of rotation to prevent the accumulation of fungus and parasitical diseases that already cut down the yield materially, and that sooner or later unless checked will make farming extremely hazardous. These plant diseases are on the increase and the only feasible remedy so far suggested is to rotate the crops. Rotation in accordance with the plan outlined on the demonstration farms also tends to prevent the injurious multiplication of weeds and positively insures the continued fertility of the soil. There is therefore every reason for farmers to adopt a systematic rotation of crops with not a single argument in favor of

the too prevailing system of single crop farming.

The demonstration farms have not been in operation long enough to prove the best results, but the advantages of rotation may be seen from what has already been demonstrated. The state could well afford to enlarge the work and establish a demonstration farm in every county in the state. No state funds can be appropriated that will bring larger returns than for the establishment of more demonstration farms.

The advantage of the demonstration farm consists in this, that every farmer can see and understand all the operations. It also has the merit of being comparatively inexpensive. A dozen demonstration farms can be operated with less expense than one sub-station and accomplish a dozen times the results. The duplication of sub-stations adds nothing to the improvement of farm methods; they simply duplicate each other's work and besides are very expensive. Furthermore farmers are not demanding them. The demand usually comes from politicians and commercial clubs bent on securing local institutions for the benefit of towns and resident real estate agents. It would be well therefore, to cease further multiplying the expensive sub-stations and adopt the cheaper and more readily understood demonstration farms. The attention of farmers is invited to this subject. Their wishes should have first consideration for the burden of support, not only for the maintenance of sub-stations, but that of all other state institutions and the state government as well, falls chiefly upon them.

### LESSON OF THE YEAR

For several seasons past the state has had excellent crops. There has been an abundance of rainfall, timely and well distributed, but at last there has come a season when the amount of rainfall is exceptionally small; when, in fact, there has not been what might be considered a rain-storm since October last. There was considerable snow during the winter and a heavy snow-fall in April which furnished considerable moisture to the soil, but since the crop was put into the ground there has been almost continual dry weather.

The total rainfall for the three months, May, June and July, was 2.56 inches; or, distributed over the month of May .82 inches; June .83 inches; and for July .91 inches. Thus the rainfall has been exceptionally low.

The season has been so dry that very little of grass or hay has been grown and it has been a test of good farming. Object lessons are abundant for the present year. One farmer finds his crop not worth the harvesting; another reports

from 20 to 25 bushels, and even 30 bushels per acre; and of two men upon adjoining farms one may show a total failure and the other a fair crop. Why is this? Crops put in early had an advantage, but aside from this there are marked differences. The writer is acquainted with a farmer who has a herd of cows, cultivates his land well and produces a variety of crops, and on threshing his yield of wheat is above 20 bushels per acre. Another farmer adjoining does not consider his crop worth harvesting.

This certainly should be an object lesson for the people of the state. Good farming, crop rotation and well cultivated land for the present season in the Red River Valley is yielding a good crop. But the land which has not been well cultivated and on which wheat has been grown year after year is largely a failure.

Another thing, corn is doing well. Those who have a field of corn will have abundance of feed for a dry year. More than that the land will be in shape to produce a good crop of wheat the coming year, the same as has been produced the present year upon fields where corn was grown in 1909. Diversified farming and better cultivation of the soil is what is necessary to secure good crops year after year, leave the soil in good shape, and keep our farms from being depleted and run out as are many of the Eastern farms where similar bad methods have been followed.

Question. At what stage shall we cut our fodder corn?

Answered by Prof. J. H. Shepperd, Dean of Agriculture, North Dakota Agricultural College. The amount of dry matter in a corn field increases at almost a regular rate from the time of tasseling until fully ripe. In round numbers it is as follows; when in silk it has twice as much dry matter as when in tassel, when in milk three times, when glazed four times, and when ripe five times as much as when in tassel. The digestible matter also increases as the corn matures so that the increase in dry matter is even less than the increase in digestible matter per acre. With these facts in mind one cannot be left in doubt as to the importance of allowing corn to become as ripe as possible before cutting. It should not be left, however, after it is ripe for the leaves to be broken off by the wind and the digestible matter bleached out by rain and dews. The common mistake, however, is for the grower to cut it too early.

When writing advertisers please mention the North Dakota Farmer.

**GRAND 5-YEAR OFFER, PAGE 20**



# Livestock Department

PROF. W. B. RICHARDS, Editor

## THE COW

The National Dairy Union, E. K. Slater, Secy, St. Paul, Minn.

The dairy cow, if able to express herself in a way which the human family would comprehend, might well lay claim to being man's best friend. She might establish such a claim by calling attention to the fact that from her product and from her carcass man manufactures more of the necessities of life than from any other similar source. She furnishes these necessities to him from infancy until such a time as temporal things are no longer associated with his existence, and she does it ungrudgingly and constantly.

In addition to contributing to man's necessity and his pleasure, the prosperity of an agricultural community is more closely identified with her than with any other of the domestic animals. The horse is quite essential in tilling the soil, but where necessity requires it the sturdy son of the cow can take his place, as he has done in every agricultural section on earth. The horse can only furnish labor and can only return a profit to his owner when conditions are right for returning satisfactory grain crops. It is a well known fact that the dairy cow is the salvation of the farmer in times of poor crops as she is able to convert the rough crops which are never a total failure, into dairy products which always have a cash value.

In addition to this she furnishes skim milk and butter milk for the calves, pigs and poultry and fertility for the soil, without which a farm becomes less valuable each year and the whole country less prosperous.

The elimination of the dairy cow would necessitate an almost revolutionary readjustment of man's tastes and requirements. It would mean untold suffering and hardship. Of course she will not be dispensed with but her value can perhaps best be appreciated by contemplating such a loss.

She will continue to be man's best friend as long as the human family exists and will keep on supplying him with his greatest needs just as she has done thru all the ages.

## NORTHWESTERN LIVESTOCK SHOW

One of the features of the Northwestern Livestock Show, which is to be held at South St. Paul November 15th to 18th, is the students' judging contest.

These contests have been held each

year during the past three years, and never failed to draw a large and enthusiastic attendance of students from the various agricultural colleges in the territory of this show. The young men take keen interest in these competitions and appreciate very much the prizes which are offered.

The contest is open to regularly enrolled under-graduate students from the agricultural colleges of Wisconsin, Minnesota, North Dakota, South Dakota, Montana, Idaho, Washington and Manitoba. Entries from each college are limited to five men and each student competing must have been in attendance at the college which he represents all or part of the year 1910.

The Association offers one hundred dollars for the students' judging contest, to be divided into eight premiums, based on relative aggregate standing in the horse, cattle, sheep and swine classes. In addition to this, the Minnesota Livestock Breeders' Association offers on the same conditions the additional sum of fifty dollars, so that the prizes are attractive to the students for competition.

Contestants in this class must send in their names not later than November 12th, 1910, and are required to pay an entry fee of one dollar. It is expected that this year this feature of the show will attract a larger number of students than it has heretofore, because the show is now much better known, and the students' judging contests in the past have been conducted in a manner to reflect credit on the show and encourage these young men in their desire to enter into the competition another year.

The students in the various colleges spend considerable time in fitting themselves for this contest, and the friendly rivalry and pride in the alma mater is in evidence on all sides at the time of the competition.

## THE CATTLE MARKET

Taking into account the hot, dry weather in most sections of the Northwest, the deterioration of pastures, the shortage of water for stock, the general nervousness of the stock owners and the consequent heavy shipment of all kinds of livestock,—prices have remained as firm as could be expected on all classes, and considerably stronger on cattle than the conditions seem to warrant.

In the cattle market, while there have been some declines in prices, the losses have not been severe. The drop was

about the same on all classes of cattle. The demand for good killers was strong. The poor class of what might have been "Killers," instead of going to the packers, found a ready outlet thru the country buyers' strong demand for stockers and feeders, for points in Iowa, Southern Wisconsin and Illinois where the weather conditions have been more favorable, and where stockmen have not been afraid to increase their herds.

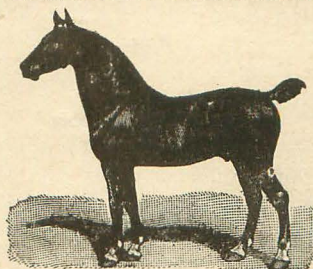
Veal calves have sold strong all month and they are on a good basis at this time. The supply is liberal, but the packers are taking all they can get and looking for more.

The Hog market weakened after July 6th and shows an average decline of about 75 cents. The market at South St. Paul shows up well and has attracted hogs from a greater radius than usual; receipts have been good. Buyers are beginning to show preference for some grades over others. Earlier in the year the idea prevailed that every hog was a high grade hog and not so much preference was shown as is being shown at this time. The preference of buyers is for the smaller hogs and has caused the heavy grades to take a big slump. The tendency to return to normal conditions has brought down hog prices generally, but the lighter kinds have sold to the best advantage and will continue to do so.

Sheep prices have suffered a serious decline in all classes on account of the heavy supply. The sheep run for the month of July this year at this market has been nearly 100% higher than in the same period in 1909, and the increase

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The Lawrence-Williams Co., Cleveland, O.



has been nearly as great at the other markets. Advices seem to indicate that the run this fall, especially from Montana will be heavy and no considerable increase in prices can be expected.

The general idea which prevailed lately that on account of the protracted dry period, the feed crop will be insufficient to carry the stock over the coming winter, seems to be changed somewhat in most sections; better weather conditions have helped the pastures and the hay and other feed considerably, and stock owners are beginning to take a brighter view of things.

Below are figures showing receipts of cattle, hogs and sheep for this and last year, and also a schedule of ruling prices.

#### RECEIPTS

##### Cattle

1910	July 1st-21st	Jan. 1-July 1
July 21	1318	30,321
1909	850	15,732
1910	1675	44,106
1909	843	24,808
1910	416	20,089
1909	713	10,207

##### Cattle

Dry fed Steers	4.00-7.50
Dry fed Heifers	3.50-6.50
Butter Cows	2.85-3.35
Canners	2.30-2.85
Veal Calves	3.00-7.00
Grass fed heifers	3.25-3.75
Grass fed bulls	2.75-4.50

#### Stockers and Feeders

Good-choice feed steers	900-1150
Common to good steers	2.50-3.75
Stock heifers	2.50-3.25
Stock steers	3.00-4.00

##### Hogs

Price Range	Bulk Range
8.10-8.70	8.20-8.35

#### Native Shorn Sheep

Spring Lambs common-choice	4.00-7.00
Yearling lambs fair-choice	4.00-4.50
Bucks	2.00-3.00
Breeding Ewes good-choice	3.50-4.00
Cull Ewes	1.50-2.50
Ewes Common-Choice	2.75-3.50
Wethers	3.75-4.00
Cull Yearlings	4.00-4.50

Yours respectfully,

St. Paul Union Stockyards Co.,

By Wm. Magivny,

President

#### HOW WE GOT THE COW

By J. M. Kock, in Indiana Farmer

No more interesting or important class of animals exists than those of

#### ST. PAUL UNION STOCKYARDS COMPANY REPORT FOR JULY

##### Comparison of Receipts and Shipments

	Railroads	Cattle	Calves	Hogs	Sheep	Horses	Total Cars
M.St.P.&S.S.M	7263	3426	5606	3723	.....	.....	379
C. R. I. & P....	119	20	938	201	.....	7	25
C. M. & St. P. P.	2755	673	8004	7309	.....	.....	274
M. & St. L.....	1387	374	7222	338	.....	1	182
C.,St. P.M.&O	3391	1285	14048	5352	.....	2	382
C. B. & Q.....	248	110	1214	1058	.....	.....	37
M.St.P.&S.S.M	7263	3426	5606	3723	.....	.....	379
Gt. Nor.....	9047	4072	12106	3191	.....	190	524
Nor. Pac.....	6974	2174	3821	11086	.....	458	375
St. P. B. & T..	.....	.....	.....	.....	.....	.....	.....
Driven In.....	486	107	690	190	.....	.....	.....
Total.....	32255	12594	56210	33260	.....	658	2249
Increase.....	15239	5477	22110	18292	.....	.....	962
Decrease.....	.....	.....	.....	.....	.....	458	.....
Jan. 1 to date	164386	67231	429668	179516	.....	3513	13589
Increase.....	21559	21419	.....	38462	.....	.....	1555
Decrease.....	.....	.....	43308	.....	.....	486	.....
Average Wts..	761	150	259	79	.....	.....	.....
Shipments							
C. R. I. & P....	1201	66	.....	466	.....	4	41
C. G. W.....	1276	55	.....	3646	.....	2	56
C. M. & St. P.	3955	205	123	6267	.....	65	158
M. & St. L.....	655	39	.....	467	.....	36	24
C.St.P.M.&O	1534	1158	987	442	.....	46	78
C. B. & Q.....	10841	60	7871	7640	.....	454	435
M.St.P.&S.S.M	473	41	185	881	.....	10	29
Gt. Nor.....	482	80	.....	.....	.....	9	18
Nor. Pac.....	90	6	.....	602	.....	18	7
St. P. B. & T..	.....	.....	.....	.....	.....	.....	.....
Driven Out....	501	211	61	87	.....	20	.....
Total.....	21008	1921	9227	20498	.....	664	847
Increase.....	9847	.....	6260	15328	.....	.....	387
Decrease.....	.....	249	.....	.....	.....	683	.....
Jan. 1 to date	101087	17820	78793	107194	.....	3832	4747
Increase.....	2861	1213	.....	22819	.....	.....	192
Decrease.....	.....	.....	17905	.....	.....	181	.....

##### Comparison of the Origin and Disposition of Livestock

		Origin of Livestock received				
States	Cattle	Calves	Hogs	Sheep	Horses	Total Cars
Minnesota.....	13648	7868	38002	8045	10	1126
Wisconsin.....	5603	3086	4985	8354	2	331
Iowa.....	198	.....	266	220	.....	16
Far South.....	.....	.....	.....	.....	.....	.....
So. Dakota. ..	3808	637	4608	156	1	220
No. Dakota....	8423	984	8349	879	56	442
Montana.....	537	18	.....	15606	589	113
Far West.....	.....	.....	.....	.....	.....	.....
Manitoba&NWT	.....	.....	.....	.....	.....	.....
Far East.....	.....	.....	.....	.....	.....	.....
Returned.....	38	1	.....	.....	.....	1
Totals.....	32255	12594	56210	33260	658	2249
Disposition of Livestock						
S. St. Paul Pkrs	11215	10582	47299	11886	.....	.....
City&StateButch	1372	250	988	217	.....	69
Outside P'k'rs.	52	1154	7888	2851	.....	109
Minnesota.....	2276	276	185	868	72	69
Wisconsin. ....	478	1	.....	426	11	20
Iowa.....	2198	62	.....	1043	.....	71
Nebraska.....	.....	.....	.....	.....	.....	.....
Kans. & Mo....	93	.....	.....	.....	58	4
So. Dakota. ..	395	59	.....	294	18	14
No. Dakota....	124	.....	.....	308	.....	4
Montana&W	.....	.....	.....	.....	.....	.....
Far South.....	.....	.....	.....	.....	.....	.....



the group known to science as the genus *Bos* or *Ox*. In India they are regarded as sacred, in Egypt they are worshipped as the god *Apis*, and Aaron's golden calf was but typical of the fact of the factor which domestic cattle have constituted in the wealth, as well as the religion of many nations. Milk, cheese, butter, hides, tallow, horns, bones, etc., as well as the labor of the live ox, have played a part in human welfare, industry and commerce that has not been equalled by the usefulness of any other sort of live stock.

While our common cows are the best known and most widely distributed, there are other species of the bovine genus. Among them we note the following:

1.—The American Bison, commonly called the buffalo. That these animals, once so abundant in the West and now so nearly extinct, are closely related to our domestic cattle is evident from the fact that the male bison readily mates with the common cow and that the offspring is fertile. The hybrid, sometimes called the "catalo," has been crossed and re-crossed and it has been found that any degree of bison desired can be introduced into a herd of cattle. The fertility of the hybrid seems to indicate a closer relation between the bison and the cow than exists between the donkey and the horse. This is rather remarkable considering the difference in form and structure of these animals and the fact that the bison possesses one more pair of ribs than does the cow.

The bison are the only native cattle of this continent. The musk ox of the arctic regions is not classed in the genus, but holds a place of its own between the ox and the goat. The wild cattle of South America, like the wild horses of this continent, are feral and have come from escaped domestic stock brought from Europe by the Spaniards.

2.—The European bison is called by the Germans the *Aurochs*. A small herd of these large beasts still roam in the great forests of Lithuania. They are larger than the American bison, but their heads and shoulders are proportionately smaller and less shaggy. In summer they shed their manes entirely. Once these huge creatures abounded thruout all Europe. They were still common in some localities during the earlier Christian centuries. Probably it was one of these great oxen that *Ursus*, the black giant of "Quo Vadis" fame, contended with in the amphitheatre at Rome in the time of Nero and killed by seizing his horns and twist-

Manitoba&NWT .....	.....	.....	.....	.....	.....
Mich. & E.Can.....	.....	.....	.....	.....	.....
Chicago.....	4684	69	166	14376	236
Ills (ex Chicago)	4226	49	.....	115	53
Eastern Points.	5072	.....	.....	.....	216
Returned.....	38	1	.....	.....	1
Totals.....	21008	1921	9227	20498	664
					846

ing his neck until the bones were broken.

3.—The Water Buffalo. This animal is a native of Southern Asia and Northern Africa. Wild herds abound in marshy jungles. The modesticated buffalo is common in India, the Philippine Islands, and thruout many oriental countries. It supplies milk, meat and hides. The Buffalo oxen are large, strong and gentle. These animals are scantily covered with coarse hair and are armed with powerful horns turning out and backward. They are fond of the water and have a habit of wallowing in the mire. The American bison has the same habit, as his wallowing places yet to be seen all over the unplowed prairies of the great west attest, but he was less inclined to the water than the oriental buffalo.

4.—The Cape Buffalo. This species inhabits southern Africa and is closely related to the foregoing. Its horns are very large at the base, practically covering the entire skull. The wild bulls are vicious and formidable and are feared by hunters more than the lion.

5.—The Gaur, or Bengal Bison. This member of the group belongs to East India. It is large in size, dark in color, and has very stout, flattened horns with a broad convex crest between them.

6.—The Gayal, another East India ox. It has short horns and white legs.

There are doubtless other varieties of wild cattle inhabiting some of the remote jungles of the far eastern lands and of the islands of the sea; all of which are of interest to science, but of little value to agriculture.

7.—The Zebu or Sacred Ox. Worshipped by some, worked and eaten by others, this hump-shouldered ox is common in India and thruout the East generally. There are zebras of many sizes, colors and breeds. Some are raised for their flesh and others for the milk. A tall white variety is used under the saddle and the heavier types are adapted to the yoke. They mate with common cattle and produce fertile progeny, altho they differ in number of vertebrae in the backbone, in voice, and in habits. Zebus, it is said, prefer the burning tropical sun to the shade and never stand in the water as other cattle are wont to do in hot weather.

8.—The Yak. Here is a breed of cattle that should be introduced into Alaska. They flourish among the mountains and in the cold. They are covered with very long hair and have tails like horses. They would doubtless solve the problem of supplying the far north with beef and milk. The home of the yak is Siberia and Thibet.

9.—Urus. This is the extinct ox of Europe. It was common in the time of Caesar and is mentioned in history as late as the sixteenth century. Writers on the origin of our domestic cows mention three species of wild cattle from which the different modern breeds have descended. But on the supposition that those species were but varieties of the urus, they will not now be treated separately. It seems very plausible that all of our present breeds of common cows have come from some sub-species or varieties of the urus.

From the skeletons preserved in the European museums, it is evident that the urus was of enormous size and possessed a spread of horns equal to that of the Texas steer of former years. It is believed to have been domesticated by the Swiss lake dwellers and by other semi-civilized peoples.

10.—British Wild Cattle. There exist today in a number of large game preserves on the British Isles herds of wild cattle. There seems to be no historic records to determine their origin, but it is probable that they have descended from the sub-species of the ancient urus. It is also reasonable to suppose that some of the present British breeds of cows have come from the same stock from which the wild park cattle have sprung.



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Silver Creek, N. Y., Apr. 8, 1909.  
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DR. B. J. KENDALL CO., ENOSBURG FALLS, VT.



The British wild cattle are of medium size, white in color, and provided with white horns of medium length having black tips. In some herds the ears and muzzles are brown, in others they are black. It may be observed that in sections of the south and west of this country where cattle of early British ancestry run at large and mate at will there is somewhat of a tendency for white calves with brown ears and brown spots on the sides to appear. This may be explained by the law of reversion to an original type thru lack of selection in breeding. Some times a white calf is born to a well bred Hereford, Devon or Red Poll stock. Such an instance does not indicate impurity of blood. If not an albino, it is a case of atavism. All British cattle doubtless came from stock among which white was common. A white Short-horn signifies no more than in that breed the white color has been perpetuated along with the red and roan. A brindled Red Poll, a black and white Jersey, a red and white Holstein, a spotted Galloway or a Red Angus do not necessarily denote bad breeding, but often a mere reversion of type as these colors once existed in the foundation stock of these breeds respectively. The red wild cattle of South America are said to be of Holsteins origin taken to that country before it became the fashion for Holsteins to be black and white. It may also be of interest to note that there were herds of polled cattle in England and Scotland before any attempt was made towards the development of our modern types of cows.

#### DAIRY PRODUCTS AS FOOD

E. K. Slater, Sec'y National Dairy Union

The product of the dairy are perhaps the most useful articles included in the human diet. A meal made up of dishes into which no product of the dairy cow enters would not be such as to inspire "the turnpike road to people's hearts I find lies thru their mouths, or I mistake mankind." Take away the butter for the bread, the cream for the coffee and the porridge, the shortening in the crust and the biscuits, the milk in the gravy and in the puddings, the cream for the dessert and the various kinds of cheese which please and satisfy, then take away the cup of milk for the little one and the meal that would be left would be neither tempting nor nutritious.

The health of our people depends so much upon an adequate supply of pure dairy products that even a scarcity is always attended by suffering and death.

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North Dakota Farmer, Lisbon, N. D.



luxury. This is a mistake. Butter is not a luxury but one of the necessities of life, and its composition is such that nothing can take its place and perform the same functions. It is nature's product compounded in the maternal organism and the process is in accordance with nature's law, a law which man can imitate but cannot understand. Man can manufacture from various fats and oils a substitute for butter but it cannot take the place of nature's product because man cannot understand the needs of the human body as nature understands them.

The animal body is developed best when nourished by foods which have been little manipulated by man and machinery. Dairy products are, as a rule, consumed nearly as nature produced them. This is particularly true with milk upon which the growing body must depend. In the case of butter only a small percentage of other products

horse remedy without calling to mind Kendall's Spavin Cure.

Perhaps no other single horse remedy has ever been so generally used or had so great a reputation. Almost everybody who owns a horse has heard of Kendall's Spavin Cure. Its popularity has not been confined to one locality or state. It is national, even world-wide. It is found on the shelves of well posted horse owners in many countries.

It is worth while to remember that Kendall's Spavin Cure has been in use for nearly half a century and its popularity is greater now than ever before. If it had not stood the test it would have been out of mind long ago.

This old favorite horse liniment is on sale at drug stores everywhere. The excellent horse book entitled "A Treatise on the Horse and His Diseases," can also be had free at drug stores or by writing for it to the publishers, the Dr. B. J. Kendall Co., at Enosburg Falls, Vermont.



Playmates.

are added to the fat extracted from the milk. Man only manipulates it in order to put it in convenient shape for use. It can still be termed a product of nature designed as only nature can design for use as food by the human body.

#### THE HORSE REMEDY THAT EVERY DRUG STORE SELLS

A very trivial thing oftentimes causes a horse to go lame, such as a slight wrench, a sprain, a cut, etc. These are things that are to be expected. They are liable to happen to any horse at any time. The lameness may cause inconvenience but it is not otherwise serious. All that is necessary in many such cases is to be ready to treat promptly with some efficient remedy.

In this connection it is a suggestive thought that for over a score of years one could hardly speak or think of a

#### PORTABLE HOG HOUSES

Geo. P. Williams in Breeders' Gazette

There is a growing interest in providing a hog equipment that may be moved from place to place and from field to field; with this end in view we constructed two new houses this spring. We aimed at securing the maximum size that might prove practicably portable under average conditions, and at the same time be adaptable to the miscellaneous uses that general farm conditions demand, when not needed for hog shelter. One of our houses is six feet to the plate, the other four and one-half feet. Both houses are sixteen feet long and eight feet wide, with shingle roofs. These houses have a 2x6 foot door in the end, and two smaller doors in one side, to provide for three sows at farrowing

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time, temporary gates being used for inside partitions. We move these houses on flat bob sleds coupled by a chain, two horses having been used for draft.

These houses have proved satisfactory, but our experience with them has suggested criticism. If made sufficiently strong the houses prove too heavy; for a short move of 200 feet one team is sufficient, but not for long pulls. The insertion of the bobs requires two men, and this has proved an objection in our case. We require this sized pen for accommodating our shoats in winter, but for the man who finds a smaller house sufficient these pens might be found too unwieldy.



# Summer Management of Bees

By M. V. Facey, Supt. Honey and Bee Department  
Minnesota State Fair

## CONTROL OF SWARMING

Whatever may be said about the wonderful advance in beekeeping methods during the last two or three decades it must be admitted that beekeepers have adopted improved methods very tardily. Altho one of the best methods for swarming bees at will was published over thirty years ago yet many of our prominent beekeepers still allow them to swarm naturally and it is only within the last few years that we have as a body even seriously considered or practiced any method of swarm control. The subject has during the last few years been widely considered and is now taken up and practiced by many of our largest beekeepers. It is quite probable however, that nine out of every ten farmer beekeepers who read this article still permit their bees to swarm naturally. Three great reasons may be given in favor of control of swarming. The first which I will consider is economy of time and convenience.

Swarming time comes in a busy season to the farmer, when it is very provoking to him to drop everything to go and hive his bees at a cost of from one to two hours of time for every swarm. Sometimes a swarm goes back again after coming out and clustering; in such cases they may be expected to emerge the next day thus requiring a second trip from the field but most provoking of all is when they leave for the woods just as you are ready to hive them or where they leave just after hiving as they sometimes do.

These experiences are common and often very trying to the enthusiasm of the beekeeper. The second reason for control of swarming is the serious loss in bees resulting from the departure of these swarms. If farmers and small beekeepers clipped the wings of their queens or made any attempt to lessen the number of afterswarms, as most specialists do, this loss would be greatly lessened but they do not and as nearly as I can ascertain they suffer a loss of nearly 25% of their increase from this cause.

The third reason is that bees, permitted to swarm naturally, frequently overswarm. It is seldom wise to more than double the bees, yet if left to themselves they nearly always cast a second and often a third and fourth swarm. All beekeepers are aware of the fact that

they get their big yields of honey from strong colonies, hence bees, in over-swarming, do so at the expense of their honey crop and sometimes of the very existence of the colonies themselves. The wise beekeeper, in swarming his bees uses every effort to build up and keep them strong for the honey harvest and rarely more than doubles his colonies even in the best of years. I have said that not over one farmer out of ten, perhaps not that many, controls the swarming of his bees and yet there is no class of people to whom it means so much whether his satisfaction and ease be considered or the amount of his honey crop. Instead of leaving his work at inconvenient times and spending a couple of hours, lost time included, to hive each swarm, he can select his own time to divide them and do the work in about 10 minutes, or about the same time as was formerly required for one by the old system is sufficient for the handling of 10 or 12.

The operation itself is quite simple but requires the use of some judgment. Mistakes in judgment will likely occur at first but ought not to cause discouragement as you will readily acquire the proper skill and judgment. When a hive becomes overcrowded with bees and brood and neither the bees have sufficient room to work to the best advantage nor the queen space to continue her work the bees are in condition to swarm. The ventilation of the hive, the condition of the weather and of the honey flow will, however, hasten or retard their inclination in this line.

When a colony swarms, whether naturally or under compulsion nearly all the old or field bees go with the swarm, hence there should be plenty of young and hatching bees in the hive and also, as we frequently divide them at times when no queens are as yet started in the hives and also to furnish the parent colony such additional bees as they may require to ensure the best results, there should be plenty of brood in all stages. Having decided the colony is in proper condition for division you set the hive to contain the new swarm beside it, preparatory to the operation. The next step is to find the queen. This is not difficult with Italian bees whose queen keeps on about her business during inspection, but with black bees and a new beginner it is the most tedious part of the work as she has a tendency to desert

the combs and take to the side of the hive when disturbed. Knowing this we use as little smoke as possible and in every way work as quietly and smoothly as possible; we give just a puff or so at the entrance to quiet the bees around it and then just enough as we raise the cover to drive down most of the bees above the frames. After that we use just what smoke is necessary to control the bees. Previous to about 11 o'clock in the forenoon the queen will generally be found upon the central frames so I spread the frames just enough to permit me to carefully lift out the third frame from either side of the hive, which you look over on both sides for the queen.

If after careful inspection she is not found, set the frames with its bees into the new hive and take out the next frame and repeat the process. You will thus continue across the hive until one-half or more of the frames, with bees, have been transferred to the new hive. Having not yet found her you look over the two frames left on the first side of the hive and also the bees on the side of the hive next; then failing still to find her you set them back in their place and continue with the balance of the frames setting them after examination beside the first two frames. Sometimes all the frames may be gone over without success, in that case, I look over the frames which were placed in the new hive

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GRAND 5-YEAR OFFER, PAGE 20



again and place them after inspection over to the vacant side of the hive. I then try the old colony again, going over each frame carefully and observing as I lift them out whether possibly she may be taking a run across the bottom or side of the hive; as you reach the side of the hive, look over it very carefully as she may be there.

Italian bees stay in their place on the frame but black bees have a tendency to work toward the bottom of the frame and drop off in bunches into the hive below rendering the search for the queen very difficult. In such cases, turn your frame bottom side uppermost and as the bees drift back watch for the queen. In thus handling the frame be careful never to hold the frame flatwise or inclined that way as in hot weather it may drop out or be weakened. If the bees gather in a bunch or heavily on either side of the hive, a little smoke will scatter them or if they show a tendency run out at the entrance, a puff or so of smoke will check them.

These directions for hunting the queen may convey the impression of a tedious undertaking but they are given to cover any possible difficulty a beginner may encounter; quite commonly she will be found by the time the third or fourth frame is reached and generally before the frames have been gone over once. She is easier to find when honey is coming in freely than during a scarcity. After about eleven o'clock the queen is often in one of the outer frames of the hive and the search may commence with the first outside frame.

Having found the queen, put her with two or three frames of the youngest brood, and clinging bees, into the new hive after removing all other frames back to the parent colony. You will remove the latter to a new stand and give them frames of drawn comb or foundations in the place of the removed ones and place the new hive, filled out with frames of drawn comb or foundation upon the old stand. If you do not have the comb or foundation alternate your frames of brood with empty frames to ensure straight combs. The bees in the fields and other field bees going out, will all return to the old stand and thus assuring a splendid swarm ready for business both in the hive below and any super you may give them.

At first some mistakes may be made and the operator may be somewhat awkward but he will soon get used to the work and there is never any missing or fly-away swarms by this method; the time selected for the operation may be such as will be most convenient to the operator and the average time required will be, if the hive is ready, about 10 minutes for blacks and less for Italians.

If the colony you are about to divide be a two or three storied hive, and if

there is no brood in the upper stories, remove them and proceed as above; if these upper stories are pretty well filled with honey place them back over the old or removed colony but otherwise place them over the new colony. In either case you need not disturb the bees therein. If there is brood in the upper stories lift the upper body, having any considerable amount of brood in it, into a bottom board and proceed to look for the queen in it and you will likely find her there; place her back into her hive, remove the bottom hive, if filled with brood, to a new stand without disturbing its frames and place as many upper stories on the new colony as the old one had before division.

Sometimes you may be greatly rushed with your work, you want to save your bees but do not have time to hunt a black or difficult queen; in that case, if you are dealing with a colony occupying a single hive, simply place three frames of the youngest brood with their clinging bees into the new hive and fill out the remainder of the space with either drawn comb or foundation; remove the parent colony to a new stand and place the new hive in its place, put an upper story on to both your new made and the

parent colony and your work is done. In case you are thus dividing a two or three storied colony with brood in the upper stories simply place the upper body that has any considerable amount of brood in it upon the old stand, removing the lower body to a new stand. In this case let the old hive (removed hive) have as many upper stories as previous to division and also give the new colony an equal number. As you become used to the work other styles of division suitable to special cases will suggest themselves.

#### PREVENTION OF AFTERSWARMS

Nine days after dividing your bees go over all colonies from which you removed queens and nip out all but one of the best queen cells and you will have no further swarms from them. In case you did not find the queen, if the divided hive had but a single story, look for cells first in your new colony on the old stand; if you find cells there the other or removed hive will contain the queen; but if you find the queen there you will find the cells in the parent colony. In case the hive was a double story with brood above look over the old colony first for queen cells as there is seldom any doubt of its being the queenless one.

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You may utilize any newly hatched queen, when dividing your bees, by allowing her to run quietly from above into the hive deprived of its queen, at the time of the operation. If you use a fertilized queen roll her in some honey of the hive into which she is to go and let her run down into the hive; by the time the bees have removed the honey she has acquired somewhat of the scent of the hive and will be accepted.

If you have some colonies more industrious than others you can use all their good cells by destroying all the

cells of less desirable strains and replacing a selected one for their use. Be careful in the handling of the cell during this transplanting process.

To conclude this article on dividing bees I would say do not overswarm them, check any temptation to do so; keep your bees strong and you will get larger crops of honey and, in the end, have more colonies. Strong colonies, well taken care of, always net good returns when there is honey to be gathered, weak colonies are always a disappointment.

## Poultry Department

Prof. O. W. Dynes, Agricultural College

### POULTRY NOTES

August is the off month of the summer so far as the work of the poultryman is concerned. The incubators have all been put away and even the very youngest of the chicks have attained a size large enough to care pretty much for themselves. All of us who are interested in chickens feel like sitting back and watching them grow. The season of 1910 has been an excellent one for the growth of young chicks. Altho very hot at times yet the insects especially the grasshopper were more than ordinarily numerous.

Constant care, however, is a very necessary consideration in the raising of young chicks even under the most favorable conditions. After six weeks of age the danger of loss among the chicks has been reduced to a minimum. Many good poultry keepers use the hopper system of feeding with growing chicks. It is undoubtedly true that if given plenty of good water and plenty of range that the chicks thrive and grow faster if given all they will eat. Allowing food to be before them at all times so long as it is dry and free from taint will be found very satisfactory.

Separate the young cockerels from the pullets soon after the distinction between the two sexes can be seen. The young males are very much of a nuisance as they annoy the pullets and do much fighting. It will be well to get rid of the surplus cockerels as soon as they have reached the broiler stage. This will leave more room for the pullets as they attain maturity.

Broody hens are the bane of the poultryman's life during the summer season. With the general advance of knowledge on the care and management of poultry has come a more saner view of the proper way to handle the broody hen. Years ago we used to duck the too per-

sistent hen in a tub of cold water in an effort to convince her of the error of her ways. We would sometimes lock her up and starve her into submission as we might a naughty child. We know better now. It is the nature of the hen to become broody and we should take a commonsense view of the situation. Isolate "biddy" in a coop or pen where she cannot make a nest and feed her liberally on protein foods. Using harsh measures is not only cruel but wholly unnecessary.

The yearly laying period of every hen seems to be divided into two divisions. If these divisions were represented each by an undulating line the highest point in the line would be the point of highest production. These high points would be April and August. The maximum production is usually reached in April. During August after the stress of the warm weather is over a maximum for the secondary period is developed.

The coming of hot weather acts as a sort of sedative to the lazily inclined hen and if fed liberally she will often take on too much flesh. A fat hen is not always a profitable one. Care should be exercised in not allowing her access to much feed. The coming of harvest and threshing on the average farm means a veritable feast to the sharp-eyed hen but it often destroys her value as a producer.

### FEATHER OF THE BARRED PULLET

**A Potrayal of the Defects of the Barred Plymouth Rock Pullet Feather in a Way that Will, Delight Every Breeder of this Variety. The Proper Length, Width, and Barring of the Feather. Together with the Proper Spacing and Width of Bars are Fully Explained.**

By S. T. Divinia, St. Joseph, Mo.

There is a wider difference of opinion among Barred Plymouth Rock breeders

as to the correct pullet plumage, than almost any other section of this beautiful, yet difficult breed. Standard shape is much more easily discerned than plumage.

The Standard description of breast, back, tail and comb are easier of interpretation than barring and color. Our fanciers generally agree on the Standard requirements so far as mere carcass measurements are concerned, but when we come to the feather of the pullet of this variety, even successful exhibitors hold widely different opinions.

There are very many shades of color shown by the winning females of our best American shows. These shades of color range from the fairly clean colored male-line female, to the open, splotchy, bar-less specimen of some years ago.

### Four Distinct Types of Pullets in Prize Pens

The experienced eye of the Barred Rock breeder can often readily detect four distinct types of pullets in first prize pens at some of our best shows, and only by a wide stretch of the imagination could any one of them be called standard. I feel that this is true in too many of our high class exhibitions.

Unless there is more uniformity in our exhibits we are sure to lose that general attractiveness which helps greatly in keeping the interest in our chosen bird alive. The cause of this confusion is partly due, no doubt to the fact that a few breeders have made such rapid progress in breeding Barred Plymouth Rock pullets, that most fanciers, and not a few judges, have failed to keep pace with them. For long prices, these advanced breeders have placed some of their choice specimens in the show room in their customer's hands and even the judges did not know what to do with them.

### What is the Ideal Length of Plumage?

One thing that will help remedy this matter: clear our ideas, give us more uniformity in judgment is a detailed study of the feather as seen on the pullet. In studying the feather of the Barred Plymouth Rock pullet, every part of it must be considered. How many of us have any idea as to the proper length of plumage or the Barred Rock pullet—taking section by section? It is easy enough to avoid extremes. We all agree that the close, hard feathering of Cornish type is to be avoided, yet at the same time, with extreme length of feather we introduce a number of characteristics which we do not want.

### Longer Feathers are Advisable

There is no rule by which any one can determine the proper length of the pullet's feather for any given section. Generally speaking, however, I believe we would do well to lengthen the plumage of our females, for I am certain that



we find more specimens with too short than too long feathers. Close attention to this detail will help us establish uniformity in the matter.

The shape of the feather is also important. By studying the outlines of feathers from different specimens, we can readily discern many different shapes of feathers. This may be unimportant, yet paying attention to details determines largely whether or not we are specialty breeders.

#### The Barred Rock Pullet Feather is Entirely too Narrow

Speaking generally, the width of the Barred Rock pullet feather is entirely too narrow. Of all the good pullets it has been my privilege to handle, those that suited me best, those that stood out from the rest as particularly good, had without exception rather wide feathers. I do not recall a single specimen in which the feathers were too broad.

Surely the shape and width of feathers have much to do with displaying barring and surface color to the best advantage. Add to the length of feather, shape, and width, substance, texture, weight, and you have a combination that will best show off whatever barring the feather possesses.

I have before me a feather from a first prize pullet at a national show. The barring extends from end to end of the feather and is quite uniform—there is no doubt but that the pullet was awarded the blue ribbon partly on this uniformity of barring, shape considered, of course—but if her feathers had possessed greater width, the barring would have shown to a much better advantage. By paying attention to width of feather, and selecting our breeders with this point in mind, we can gradually widen the feathers of all our pullets.

It is truly remarkable what has been accomplished with the barring. While the feather itself—length, contour, substance, and width, has not had sufficient consideration, who will dare say that the barring of the feather has been neglected? But there are many details that still require attention.

Let us take now, for an example, the spacing of the bars—"regular" is the term used in the Standard. The plumage of a great percentage of the Barred Plymouth Rock females seen in our shows, has a large open space between some two of its bars. An old breeder told me that the cause was the improper development of the bird—arrested growth at some stage of its development. This may or may not be the cause—we have no means of knowing it—but by proper selections as well as proper feeding we should seek to overcome the defect.

**Shaft Should be Barred with Web**  
The bars should be the same width.

They should cross at right angles to the shaft of the feather, and extend the entire length of the feather. There should be no broken bars. The shaft should also be barred, and barred in the same places as the web. Too often the shaft barring is in the light back ground, instead of corresponding with the dark barring.

#### Where the Greatest Progress has been made

I want to call attention to the edges of dark bars. There must be a well defined boundary line between the light and dark bars—as if drawn with a pen. In no section of Barred Plymouth Rock culture has better progress been made than in straightening the boundary line of the bars. It is truly remarkable what has been accomplished, for it can be found in perfection. Taking the Barred Plymouth Rock show females as a whole, and also those in the yards of the foremost breeders, there is yet much to be accomplished. Pay attention to the upper edge of the bar, for it is almost universal that the lower edge of the bar is better than the upper. Examine any feather plate you ever saw, or the actual Barred feathers, and you will find that this is true.

Having noticed this fact, let us give it due consideration in reference to other matters, and select our breeders accordingly. If you have a pullet, with feathers both edges of whose bars are distinct, mate her separately and note the results.

#### Ideal Tipping Presents a Difficult Problem

Another matter that should receive due attention is the tipping. In this question we have a difficult problem to solve. It has a relation to the character of the surface color of the pullet. The length, width, manner of overlapping of the feathers are all to be considered in this surface color, and they all have a bearing on the tipping of the feathers. The number of bars of each feather that show on the surface, has something to do with the ringy appearance so much sought after. I have seen one or two pullets with fairly good surface, showing

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rings on the rounded portions of the bird, with no tipping at all to the individual feather, yet generally speaking, in the best surface color we find the individual feather with a narrow, dark top, the lower edge of which extends straight across the feather, the upper edge, of course, follows the contour of the end of the feather.

#### **Tipping Alone will not Produce a Ringy Surface**

While there is a great demand now for this tipping of the feather, yet my claim is that tipping alone will not produce a

ringy surface. The width of the feather, the number of bars that show on the surface, together with the character of those bars and the manner in which the feathers overlap, all play an important part in producing a handsome surface color on our pullets.

In conclusion, I want to say that it is the upper half of the feather that is the most important. The under-color craze has almost run its course—it is the easiest of all details to obtain, and it is important only as it helps display what is above it.

## School and Home

### **BACK TO THE FARM**

James J. Hill and other captains of finance and domestic economy exhort the surplus laborers of overcrowded cities, says Farmers and Drovers Journal, to go back to the land to make a living and achieve independence. Unfortunately for the development of agricultural resources, cities are growing more rapidly than rural communities, and the urban population of the country has already reached proportions to nearly consume the annual farm productions.

Viewing the shrinkage of agricultural products, as contrasted with the expanding population of cities, economists are admonishing the unemployed of cities to get back to the land, whose products represent the permanent wealth of the nation. The country is populated by immigrants, the majority of whom were peasants in their native lands. They were born and lived under a regime of landlordism and naturally were land hungry when they reached the new continent. The early settlers of the United States were principally engaged in agriculture, but they found conditions different from the husbandry of Europe.

In the northern states there was no peonage to hold help to the farm, and land owners were compelled to depend on their individual efforts to cultivate their estates. In Europe the peasantry were depended upon to work the land at very small compensation. The peasants were under a system of peonage and could not leave their landlord's estate, but in America help was scarce, often unskilled and unreliable, and land owners were forced to make personal endeavor to cultivate their holdings.

For half a century immense developing work in railroad construction, min-

ing and manufacture have demanded an army of laborers to complete the vast internal improvements. The enterprises developed paid far larger profits than agriculture, and laborers were naturally enticed away from the farm for maintenance in other occupations. Railroads, lumber industry, mining developments and manufacture were able to pay higher salaries than the profits of agriculture would justify, and the trend of population is to mass in cities and seek employment in occupations that pay larger dividends than husbandry.

The increase of urban population has now reached such proportions as to nearly consume the surplus of agricultural production, and the country is facing an era of abnormally high prices for living necessities. To continue to mass in cities and neglect the development of agricultural resources is to intensify an already precarious condition. Anticipating the future by the past, bread riots can only be averted by returning to the land and increasing agricultural production.

### **SECRETARY WILSON ON ALASKAN FARMING**

**About 100,000 acres available, he says, and Future of the Industry is Assured**

The federal government has definitely adopted the policy of encouraging settlers to take up agricultural land in Alaska and farm it. The Department of the Interior has asked Congress to appropriate \$100,000 for surveying the agricultural and grazing lands and a bill is now pending for this purpose. Still more recently Secretary of Agriculture Wilson made the following vigorous statement as to the achievements and possibilities in agriculture there to a correspondent:

"The agricultural possibilities of the territory are practically assured," said

the Secretary. "It is quite within the probabilities that the farm products there will eventually be worth more than the mineral output. Probably 100,000 - 000 acres are available for agriculture. This land can grow good crops owing to the long continued sunshine of the summer. There are at least two months when it never grows dark. The grains mature remarkably well under these conditions and hardy vegetables flourish. The very heaviest oats and barley that ever came to this office were from Alaska. We have also remarkably fine samples of wheat from there.

"Farmers in our northern states will, in the future, find that grain seeds brought from Alaska are very desirable as they are hardier than seed grown further south. Work has already begun in the development of seeds.

"We have also been introducing domestic animals there, the effort being to produce a stock suited to the climatic conditions. We have now a herd of about sixty head of thoroughbred gallopway cattle on Kodiak Island which is propagating rapidly and seems to be very much at home."

Secretary Wilson recommends that those interested should read the reports of C. C. Georgeson, of the office of Experiment Stations, who is in charge of the government's five stations in the Northland. Mr. Georgeson has watched the beginnings of real farming there and seen small fortunes made by raising supplies for the gold miners of the interior and he is an enthusiast.

An interesting and surprising possibility of the territory is in small fruit raising, concerning which Secretary Wilson is most optimistic. Not only has he been studying and cultivating the numerous native varieties, but he says he has had the scientists of the department introduce our own domestic varieties, hybridizing them with the wild fruits and creating new varieties suitable to the climate and of much merit. The department has recorded successes with watermelons, muskmelons, cherries, plums, strawberries, currants, gooseberries, raspberries and several others.

### **HUMAN RIGHTS HIGHER THAN PROPERTY RIGHTS**

**From Address by Theodore Roosevelt at Sorbonne, France, April 23, 1910**

While not merely acknowledging, but insisting upon, the fact that there must be a basis of material well-being for the individual as for the nation, let us with equal emphasis insist that this material well-being represents nothing but the foundation, and that the foundation, tho indispensable, is worthless unless upon it is raised the superstructure of a higher life.



That is why I decline to recognize the mere multi-millionaire, the man of mere wealth, as an asset of value to any country: and especially as not an asset to my own country. If he has earned or uses his wealth in a way that makes him of real benefit, of real use—and such is often the case—why, then he does become an asset of worth. But it is the way in which it has been earned or used, and not the mere fact of wealth, that entitles him to the credit. \* \* \*

It is a bad thing for a nation to raise and admire a false standard of success; and there can be no falser standard than that set by the deification of material well-being in and for itself. \* \* \*

My position as regards the moneyed interests can be put in a few words. In every civilized society property rights must be carefully safeguarded. Ordinarily and in the great majority of cases human rights and property rights are fundamentally and in the long run identical; but when it clearly appears that there is a real conflict between them, human rights must have the upper hand, for property belongs to man and not man to property.

"The farm, says James J. Hill, is the stomach of the nation; starve it and the nation dies. Land without population is a wilderness; population without land is a mob. Our only way to get back to a sound, normal basis is to get 'back to the farm.' The people must get back to the land; the unnatural, wicked, killing condition which allows great centers to become congested with non-productive citizens, while the country starves, must be done away with."

#### PLANTING THE BLACK WALNUT

With all the talk about vacant lot gardening and public playgrounds, our modern students are seeming to forget the happy childhood days when we could go to the forests nearby and fill our bags with delicious chestnuts, walnuts, hickory nuts or butter nuts. Alas, the march of civilization and the doings of the lumberman have robbed many of us of our pleasures and lucky is the child indeed who can still go "nutting."

Not to speak of the shade for the driveways leading to the house, or the ultimate profit to be gained from the wood itself, any of the nut trees planted today on the farm will in a measure help toward solving the problem of making the suburban home attractive.

Of course it can not be expected that the nut trees will mature in a few years after planting, but it will not take long for the trees to furnish abundant shade for young stock during the warm sultry days of summer.

Black walnut is a tree which should

answer the purpose very well. One of the inducements in planting this and adding bluegrass to the land, thus affording pasture for young cattle, is that there is no danger of fire, the leaves and stems of the walnut trees quickly assimilating with the soil. Even where the size of the farm will not permit of an acre or two being planted with nut trees, there certainly is room for quite a number in the vicinity of the dwelling or along driveways or roads.

Near Earlington, Kentucky, black walnuts, with the hull on, were planted in the autumn. The ground was prepared as for corn, and the nuts planted 4 feet by 4 feet, or 2770 to the acre, and covered with soil from one-half to one inch in depth. The land was cultivated

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**OURAWLOFFERTAKES, PAGE 2**

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for three or four years, the same as for corn, and then blue grass sown. In ten or twelve years the trees were large enough to permit pasturing. In another grove the trees in 20 years had attained a diameter of from 9 to 12 inches, the trees were thinned and this piece of black walnut forest afforded an ideal pasture woods. In another generation or so these groves will be worth a fortune.

#### PARENTS AND THE STATE

Parental responsibility, says the "World", is breaking down in this country, partly thru indifference and neglect, but "largely thru the assaults that the state makes upon it."

Our neighbor says no more than some one else is saying somewhere every day. There is something approaching general agreement among observers that par-

them. What has been done for children here seems to us to have been done in the main because prevailing conditions demand it. We think, not that the intruding state has made parents incapable, but that the incapacity of parents and the complications of city life have constrained the state to intrude. And as it is here, so it is in more or less degree in other cities.—Harper's Weekly.

#### WINDMILLS IN THE SEMI-ARID WEST

The rainfall in the semi-arid West being always light, settlement in that section is to a certain extent hazardous, but the millions of acres now barren, which would prove rich and fertile if irrigated, are now attracting eastern farmers who are prone to risk failure in view of the possibilities in years of favorable precipitation. Some of this land will be reclaimed thru irrigation, and the growing

the possibility of this is set out in a simple comprehensive way, and practical suggestions are made to those who are now using or are contemplating the use of windmills for pumping water for irrigation. The data given of plants on the Great Plains show, however, that the windmill is not a cheap source of power, that to accomplish this result requires capital, and that if the conditions require too great outlay, it precludes the possibility of such a procedure.

The bulletin treats on the sources of water supply, the quantity of water available, well casing, sinking wells, capacity of mills, choice of tower, erection of mills, pumps, reservoirs, maintenance of mills, crops under windmill irrigation and closes with a description of methods and mills now in use in Kansas, Nebraska, Colorado, and California.

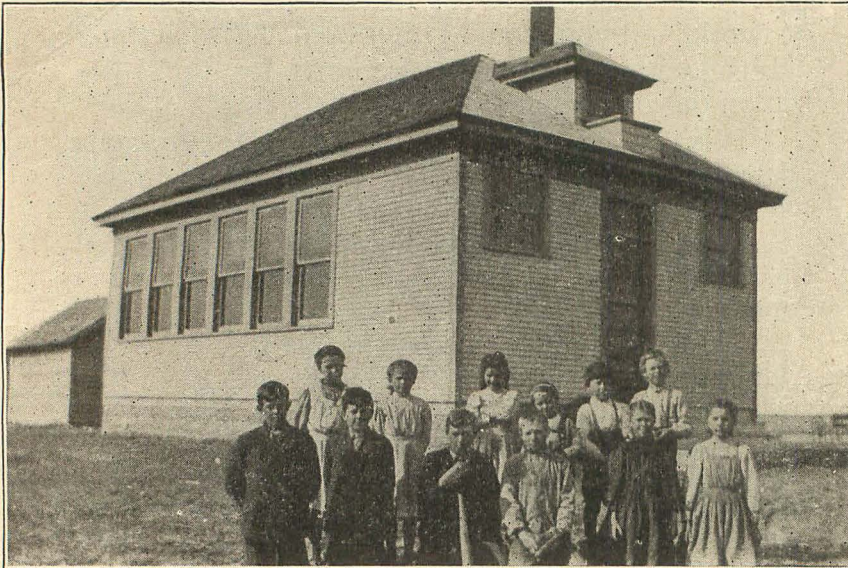
Copies of the bulletin can be secured free, by applying to the Secretary of Agriculture, Washington, D. C., to any Senator, Representative or Delegate in Congress, or, for 5 cents per copy from the Superintendent of Documents, Government Printing Office, Washington, D. C.

#### TWO MAGNIFICENT BOOKS

##### Northern Pacific Advertises Yellowstone Park and its Train Service

"On the Wings of the Wind through Wonderland" sounds like the announcement of an aerial excursion into the unexplored regions of Paradise. It is in fact, however, a combination of the titles of two really magnificent pieces of literature just now being put out by the Northern Pacific Railway.

"Through Wonderland" is a gorgeous seventy-two page book embellished with a handsome colored cover embossed in gold. The Grand Canyon of the Yellowstone stands out in all the attractiveness of artistic color-process printing and invites to a closer inspection of the book. Inside the cover lies no disappointment



The Modern School House, with Ventilating System is Replacing the "Box"

ents are played out as governors of their children. How far is that really true, and in so far as it is true to what is it due? The "World" is speaking, in the main, of life as it goes on in cities. It is in the cities that this state guardianship that it speaks of is most conspicuous, and there is probably no city in which it is more noticeable than this big one in which we live. It is harder for parents to keep the run of their children in cities than in the country. Laws and courts and schools have need to assume more responsibility about the training and behavior of the young in cities than in rural districts. That is true especially in this city, which always abounds in newcomers who are strangers to all American habits and laws and usually to our language, and are very poor besides. Such people often need to have their parental abilities supplemented by all the help the schools and courts can give

of drought-resistant crops and the adoption of improved methods of culture will do much to make the farming of these lands less hazardous. But there have been many deplorable failures which could have been averted, had the settlers fortified themselves against periods of drought by irrigating small parts of their holdings.

It is with a view of helping such that the feasibility of pumping water for the irrigation of small areas in connection with dry land farming of more extensive areas was investigated by the Irrigation Office of the U. S. Department of Agriculture.

Large wind movement provides a cheap source of power for lifting underground water, and the results of these investigations are embodied in a Farmers' Bulletin (No. 394) entitled "The Use of Windmills in Irrigation in the Semiarid West," just issued by the Department,

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for beautifully colored views are crowded thickly thruout, while each page bears a soft gray border illustration depicting bits of the Park landscape, animals, geysers, etc. Seldom does one see a more elaborate book upon the counters of the book stalls, and never before has a more exquisite and expensive publication been issued by a railroad for free distribution.

Of a character to rival the Yellowstone Park book in compelling allurements is the second work entitled, "On the Wings of the Wind." This describes and pictures Northern Pacific passenger, freight and express service, showing car interiors and exteriors, and the sights and scenes thru which the road extends. The border ornamentations in buff, gray and brown are delightful and give a life and a color to the pages such as to entice to a constant perusal. The cover is a soft gray blending of a myriad of winged "Monads"—the Monad being that mystic Chinese emblem seen in the center of the Northern Pacific trademark. A feature of the cover is a colored panel showing an attractive bit of mountain scenery just at sunset, thru which a brilliantly lighted train is skirting the bank of a dashing stream and piercing the dense shadows of overhanging cliffs.

Diagrams of cars, a comprehensive description of the service and the dining car facilities, etc., combine to make the book practical as well as beautiful.

Copies of either book may be obtained from the General Passenger Office of the Northern Pacific in St. Paul by enclosing six cents in stamps to cover postage.

The Government has decided that, pending the decision of the higher court in the bleached flour cases, millers must stop bleaching or stand criminal prosecution for each shipment of bleached flour made in interstate commerce.

At a conference between Acting Attorney General Fowler and Solicitor McCabe, of the Department of Agriculture, the latter representing Secretary Wilson, it was decided that the inspectors of the Bureau of Chemistry should be instructed to secure samples of bleached flour shipped in interstate commerce by millers and jobbers since the date of the decision in the Kansas City case, with a view to criminal prosecution of those responsible for the shipments.

The Kansas City case was a seizure of flour which the Government claimed was adulterated and misbranded because it had been bleached with nitrogen peroxide. After a five weeks trial and exhaustive testimony on both sides, the verdict in the case sustained the contention of the Government, and the bleachers have appealed the case to the Circuit Court of Appeals. The Govern-

ment holds that, inasmuch as a jury has decided that bleached flour is adulterated, during the pendency of the appeal and until determination is made by a higher court, bleached flour must not be sent in interstate commerce.

"Cold Dishes for Hot Days" is an innovation on the part of the Northern Pacific's Dining Car Department which seeks to add attractiveness to the "meals on wheels." A special bill of fare is presented to the patron which shows all of the cold dishes served ranging from cold chicken gumbo or tomato bullion thru an enticing list of relishes, fish, meats, salad, cheese, pastry and beverages. Moderate prices prevail, making the cold lunch a stroke of economy as well as a pleasing meal for hot weather. A special kitchen in the Northern Pacific's Commissary Department at Seattle produces these cold dishes exclusively, a high grade of excellence being assured thereby. Of course, it is optional with the patron whether he have a cold luncheon or not, as a regular

menu is carried entirely in addition to the cold "specials". The new move is proving very popular on Northern Pacific trains.

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## FROM THE NATION'S CAPITOL

By GUY E. MITCHELL

### "BUG" PILGRIMS SET OUT

This week seems to be getting-away week for pilgrims from the Department of Agriculture to foreign climes who are in search of solutions to problems with which the Department has had to cope for many years.

R. S. Woglum has been sent to Spain to study the general subject of citrus fruit growing and handling. While there he will also study the white fly that has made serious inroads on the fruit crop of Florida and the Gulf States. After he is thru in Spain he will go to India which is the place of origin of the white fly and try to find its parasite or the natural enemy that keeps it in check. Where an insect is indigenous to a country and yet does no excessive damage there it is almost certain that there is some natural enemy, bird, parasite or fungus disease that keeps it within bounds. When the insect pest gets outside its natural habitat it runs amuck and does damage out of all proportion to what it has been accustomed to do at home, provided its natural enemy to keep it in check is wanting. This is the case with the gypsy moth and the brown-tailed moth in New England, and the Department has been importing parasites to check them for several years. Now it is hoped to fight the white fly in the same way.

### FIG WORMS NEXT

E. G. Smythe has gone to Smyrna and thence into the midst of the fig-packing

district, to study the breeding of the worms found in figs and the sources of infestation. If his mission is a success the embargo of the American government on figs will cease to exist. The figs which had been sent into this country became so bad at one time that under the pure food law they had to be excluded from the American market. Then there was a howl from importers, exporters and consumers and the Secretary had to allow figs to come in if not more than 30 per cent of the shipment was wormy.

Congress was enough interested in the investigation to make a special appropriation to send the expert to the fig district, and he is not only officially dispatched by the Agricultural Department, but goes on the special invitation of the Turkish Government. It is thought the effects of his work will be noticeable by the time the next year's crop of figs comes on the market.

### CRUSADE AGAINST WEEDS

Acting Secretary of the Treasury Andrew has sent an order to all customs officers, directing them to take two-ounce samples of all importations of grass, clover and forage plant seeds and forward them to the Department of Agriculture seed laboratory.

This action, which is to be in effect during the present fiscal year, is at the request of Secretary Wilson of the De-



partment of Agriculture, who wants to use every means to stop the entry of weed seeds into this country. Canada has stringent laws against bringing in seeds and some of the foreign interests are said to have turned to the United States. The offending importers and their products will be kept track of by means of the data which the customs authorities will forward with the samples of all importations of 100 pounds or more, the samples to be labeled with the names and addresses of consignors and consignees, names of the seeds and the quantity of the consignment.

#### STANDARD COTTON-SAMPLES DISTRIBUTED

A special committee consisting of men familiar with the conditions of the cotton trade and selected by the Secretary of Agriculture not only because of their technical skill and standing in the business world, but because of their exceptionally high personal character, have finished their labor of fixing a standard for cotton of different grades. The standards adopted by the committee have been recognized by the Memphis Cotton Exchange, approved and will probably be adopted by the New York and New Orleans exchanges. The standard samples, have been largely approved by the English buyers who have seen them, but they have not yet been officially presented to any of the foreign exchanges.

Sample boxes of the "standard cotton samples" by which the immense crop of the United States is graded and sold are being sent out by the Department. These samples are put up in sets of nine boxes, representing nine grades of white American cotton. But while this serves as a sufficient grading standard, the trade recognizes a grade between each of the nine established by the Government and three grades above and three grades below the government scale. The cotton buyer on getting his box of standard grade samples, uses it to match the cotton that is brought to him for sale. A standard box is sold by the Department for \$35, and with good care it will last a year or more before it begins to deteriorate. While there is only a microscopic difference in the variation of cotton from grade to grade, and while there is a very small actual advance in price from grade to grade, the aggregate of the cotton crop last year was \$850,000,000, so that a very small difference in the grading of cotton would make an immense difference in the total value of the crop, both to growers and buyers.

The Department officials consider *they have scored a triumph* in fixing the original standard samples so that they would not deteriorate or change color. There has never been a permanent cot-

ton standard sample in the history of the world, the reason being that it has never been possible to keep the standards from deteriorating. In the present instance, after the standard grades had been selected with the greatest care by the committee of experts, they were put in big glass tubes, the air exhausted and the tubes sealed just like an incandescent light globe. As a matter of fact the actual work was done at one of the big electric globe plants.

Dr. N. A. Cobb, who is a native American, but who for fifteen years was the cotton expert for the government of Australia, is in charge of the work of handling the standards in the Department.

#### FREAK FOWLS HATCHED

A dispatch from Cumberland, Maryland, states that a turkey hen near that place hatched two queer looking young fowls, resembling ducks more than turkeys. One of the freaks was blind and died soon after hatching. The other was lively and grew nicely for two weeks but later died. Its head was that of a turkey and a duck. Its feet, body, and plumage were like a duck, and its legs were long like a turkey. The owner, Henry C. Werner had hoped to raise the birds for exhibition at the fall fair.

It is hoped the Colonel has not yet heard the news. It might cause him to return to Africa at once.

#### UNCLE SAM'S FREE FARMS

That a good irrigated farm of 20 or 80 acres of fertile land, watered by Uncle Sam's never-failing ditches should go begging is something of a marvel. Mr. Blanchard, the colonization official of the U. S. Reclamation Service is looking, however, for 500 practical farmers who would like to own homes of their own in the Northwest. With some of the farms a tract of grazing land has been included in the farm, unit, bringing the total up to 160 acres.

There is no drawing or any element of chance in applying for one of these farms. It is only necessary to make a homestead entry at the local Land Office. The farms are free to every bona fide homeseeker who is entitled to make a homestead entry, the only charge besides the nominal Land Office fee for filing being the actual cost of getting water to the land. Payment may be made in ten annual installments, without interest. The cost is only \$4 or \$5 per acre per year.

The farms now awaiting settlement include a wide variety of soil and climate. If a man desires to engage in general farming, or to specialize in the growing of apples, alfalfa, sugar beets,

garden truck, stock raising, dairying, raising poultry and grow up with the great west, he should write to the Reclamation Service, Washington, D. C.

#### PUBLIC MEN AS AGRICULTURISTS

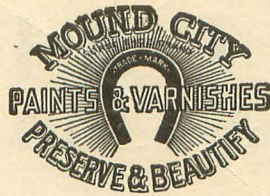
Representative Hull of Iowa, who was recently defeated for renomination in the primaries, has hied himself away to his big farm down along the Potomac, in Virginia. This farm, which consists of about 4,000 acres, was one of the things that contributed to Mr. Hull's defeat in his district. It was freely declared by his opponents that he was practically a non-resident, and that he spent most of his time on his Virginia property, returning home to warm up to old friends just about the time to start a new campaign.

Interstate Commerce Commissioner Prouty has gone away on his vacation to his Vermont farm. Judge Prouty is not given to putting in his time at expensive resorts when he goes away for his summer's rest. Instead, he betakes himself to his garden up in Vermont and proceeds to hoe it, pull weeds, and otherwise indulge himself in agriculture. Judge Prouty finds in his garden the best possible respite from the troubles of the railroads and the shippers. He maintains that vegetables are the best possible diet if taken fresh from one's garden.

#### AGRICULTURAL ASSOCIATIONS GROWING

Consular Assistant Dean B. Mason, of Paris in a report to the Department of Commerce and Labor, states that during the last 25 years an extensive movement toward the organization and co-ordination of agricultural interests has taken place in France. The principal aim of the agricultural syndicate is to enable the small farmer to purchase or dispose of his supplies as advantageously as his more important competitors and to encourage a number of social movements toward the betterment of the rural population, such as the establishment of insurance or credit societies. For a small commission, never exceeding 3 per cent, they sell, purchase, or exchange the products and supplies of their members. The influence, scope and importance of these societies have extended rapidly since their inception and they have been an important factor in the present prosperous condition of French agriculture. The French Government has contributed largely to this prosperous condition thru services rendered by the Department of Agriculture, by education, by experiment, etc., and by the loan of considerable sums at a low rate of interest to agriculturists. Up to the present time some \$66,106,000 has been loaned to 125,000 farmers.





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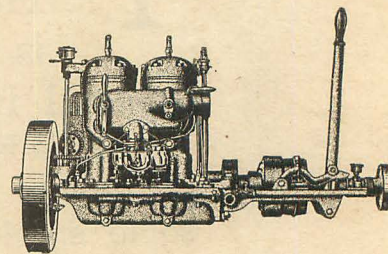
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